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MADRAS

(TNFD)

A WORKING PLAN FOR THE FORESTS OF COIMBATORE SOUTH DIVISION

1933-34 TO 1942-43

BY

A. N. SARMA, M.A., I.F.S.
(Deputy Conservator of Forests)

UNDER THE DIRECTION OF

C. C. WILSON, B.A., I.F.S.
(Conservator of Forests, Working Plans Circle)

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WORKING PLAN FOR THE FORESTS OF COIMBATORE SOUTH DIVISION.

PART I.

Summary of Facts on which the proposals are based.

CHAPTER I.—THE TRACT DEALT WITH.

SECTION 1.—NAME AND SITUATION.

This working plan for the forests of Coimbatore (South) covers 344·6 square miles, comprising all the reserves of the division, except the Mount Stuart forests, an area of 54·7 square miles, for which a separate working plan, prepared in 1931, exists. It includes an area of 26·3 square miles around Manjampatty transferred in 1934 from Madura to South Coimbatore division. An area of 5 square miles of reserved forests, classed as ryots forests and handed over for management by panchayats, has been excluded from consideration.

2. The tract dealt with comprises the whole of Udamalpet, Pollachi and Punachi ranges, and a portion of Ulandi range: and lies within the revenue taluks of Udamalpet, Pollachi and Palghat.

3. The reserves lie within latitudes 10 degrees 30 minutes and 10 degrees 50 minutes north, and between longitudes 76 degrees 75 minutes and 77 degrees 35 minutes east of Greenwich, about 60 miles north-east of the sea-port of Cochin. On the west and south lie the rich forest tracts of Malabar and the Indian States of Cochin and Travancore; on the east they adjoin the forests of the Madura division, and on the north, the cultivated lands of Coimbatore district.

SECTION 2.—CONFIGURATION OF THE GROUND.

4. The forests are situated immediately south of the Palghat gap, on spurs of the western ghats, which are commonly known as the Anamalais (elephant hills). The altitude varies from 1,200 feet—the general elevation of the Palghat gap—to about 8,250 feet above the sea. Some of the highest peaks in the tract are—

Akkamalai	8,143 feet
Thanakamalai	8,244 ,,

Anaimudi 8,841 feet, the highest peak on the western ghats is situated in the adjoining forests of Travancore State about 20 miles away from the above peaks.

5. Topographically a central range of hills extends from north-west to south-east: from this range a series of spurs extend approximately to the north ending abruptly in sheer cliffs on the Coimbatore plateau but grading more easily into the Palghat gap on the north-western extremity of these forests. On the south-west of the central spur the gradient is more gentle: the country is an undulating plateau with an elevation of 3,000 to 4,500 feet, now almost entirely taken up for the cultivation of products such as coffee, tea, cardamoms and cinchona.

6. All aspects are found in this block of hills, and streams flow in all directions. An area of 113 square miles of the forests drains east through the Amaravati river which joins the Cauvery and flows into the Bay of Bengal. The rest of the area drains into the Arabian Sea on the west, partly through the tributaries of the Periyar and Chalakudi streams in Cochin State, and partly through the Aliar and Anamalai streams which flow through Coimbatore district to join the Ponnani river flowing into the Arabian Sea.

7. An area of 159 square miles forms the catchment area of the streams flowing immediately into the Coimbatore district. These streams support extensive areas of irrigated crops in Coimbatore and neighbouring districts: the forests are, therefore, of great importance for the indirect benefits they confer, in the conservation of water.

SECTION 3.—GEOLOGY AND SOIL.

8. The underlying rock is gneiss throughout, laminated in places. The minerals commonly found in it are felspar, hornblende, biotite, garnet, and black mica: but none

of these minerals are of economic importance. The quartz in the gneiss is both fine and coarse grained. The weathering of the gneiss proceeds with different degrees of rapidity: in regions with a high rainfall the weathering is comparatively rapid, whilst elsewhere it proceeds slowly, more so as the surface of the rock accumulates a coating of the quartz when the soilforming minerals are decomposed and lixiviated in course of time. Here and there the gneiss has a high content of felspar or hornblende, and in such pockets weathering is very rapid.

9. The soil formed by the weathering of the gneiss is generally a sandy loam, rich in all mineral matter requisite for plant life. In regions with a high rainfall the potash content of the soil gets rapidly reduced unless the soil cover is retained, and in new clearings for planting of tea on the Anamalai plateau this difficulty has been specially noted. The following statement gives the results of chemical and mechanical analysis of a few samples of soil from the Anamalai plateau :—

Particulars. (1)	Soil under a tea crop. (2)	Soil under a tea crop. (3)	Soil in a new clearing. (4)	Soil in a new clearing. (5)	Soil in a nursery. (6)	Soil in a nursery. (7)
A. Chemical Analysis.						
Moisture—						
Loss on ignition (organic matter) ..	20·4	12·7	21·9	24·9	19·5	17·6
Insoluble mineral matter (sand, etc.) ..	52·5	54·9	40·4	47·4	67·9	68·9
Iron (Fe_2O_3)	19·7 }	30·7	12·9	9·8	7·5	7·5
Alumina (Al_2O_3)	4·9 }		22·2	15·8	3·5	4·6
Lime (CaO)	0·2	0·1	0·1	0·1	0·8	0·3
Magnesia (MgO)	0·1	0·1	1·0	0·5	0·3	0·2
Potash (K_2O)	0·3	0·3	0·7	0·7	0·3	0·1
Soda (Na_2O)	0·1	0·3	0·6	0·6	0·2	0·2
Carbon Dioxide (CO_2)	0·3	0·1	0·1	0·1	0·2	0·2
Phosphoric Acid (P_2O_5)	0·1	0·1	0·2	0·2	0·1	0·1
Sulphuric Acid (SO_3)	0·2	0·2	0·2	0·2	Trace.	Trace.
Total ..	**98·8**	**99·5**	**100·3**	**100·3**	**100·3**	**99·7**
B. Mechanical Analysis.						
Gravel and stone	3·8	3·5	2·9	0·5	6·0	6·0
Moisture	9·0	2·9	..	..	3·6	6·6
Matter soluble in HCl	6·2	0·9	0·6	0·6	0·9	0·5
Organic matter	20·4	12·7	21·9	24·9	..	..
Coarse sand	23·2	21·2	3·4	7·5	60·4	58·9
Fine sand	16·8	22·8	7·5	6·0	5·6	4·8
Silt	6·0	8·8	9·8	9·0	11·6	11·6
Fine silt	8·0	19·1	29·0	27·5	6·0	5·8
Clay	10·1	11·1	14·5	11·3	6·0	5·7
Total ..	**103·5**	**103·0**	**89·6**	**87·3**	**100·1**	**99·9**

SECTION 4.—RAINFALL AND CLIMATE.

10. The variations in annual rainfall from place to place in the tract are great: on the extreme south-west the rainfall is about 300 inches in the year, while on the north-east it is as low as about 20 inches. A number of rain-gauge readings for a series of years are available for the forests under consideration and the statements given below show the monthly average rainfall at these stations.

Statement showing the average of monthly and annual rainfall.

Average rainfall for 13 years from 1920 to 1932.

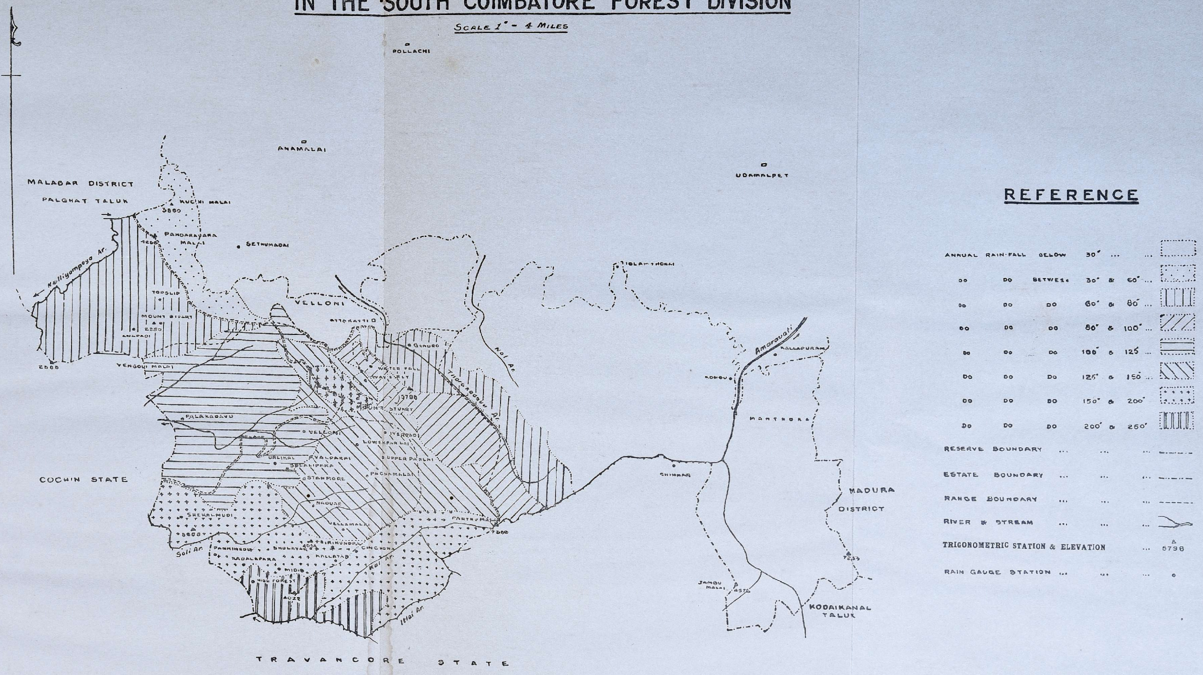
Serial number and stations.	Monthly.												Annual.	Remarks.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1 High forest	..	..	..	..	..	..	..	..	..	..	..	..	214·5	For 11 years from 1922 to 1932 and that too the monthwar figure is not available.
2 Pannaimedu	0·9	1·1	2·0	5·4	9·5	37·7	61·0	37·6	15·9	14·5	6·7	2·6	194·9	
3 Midis	0·6	1·1	2·6	6·6	10·3	35·1	60·5	38·8	16·8	13·3	6·7	2·2	194·6	For 12 years only from 1921–32.
4 Kadalaparai	0·1	0·1	1·9	4·5	19·9	29·7	38·3	50·2	22·4	14·9	8·2	2·9	193·1	For 3 Do. 1930–32.
5 Malakiparai (Cochin)	0·6	1·2	1·7	5·0	10·6	37·7	50·1	36·7	17·5	12·3	6·6	1·9	181·9	For 9 Do. 1924–32.
6 Shekalmudi	0·8	0·6	2·5	6·2	8·6	33·6	50·9	30·8	13·9	14·2	6·9	1·2	170·2	
7 Kallayar	0·3	0·7	2·5	7·7	14·2	28·4	36·1	35·2	16·2	13·4	8·0	2·0	164·7	For 4 years only from 1929–32.
8 Cinchona	1·1	1·5	2·0	6·3	11·0	28·9	41·6	35·6	14·7	11·7	6·5	1·7	162·6	For 7 Do. 1926–32.
9 Mount Stuart Estate	..	0·1	2·1	9·6	8·4	30·1	26·2	45·2	14·1	10·6	6·5	7·1	160·0	For 2 Do. 1931–32.
10 Sholayar	0·8	1·4	2·2	6·3	8·2	29·4	49·8	30·4	12·5	11·4	6·2	1·3	159·9	
11 Sherukundra	0·4	1·1	2·1	5·2	9·3	28·4	43·9	32·6	13·3	11·7	5·4	1·6	155·0	For 10 years only from 1923–32.
12 Vellamalai	0·5	1·1	1·5	5·5	9·3	27·0	32·8	31·1	12·9	11·7	6·1	1·3	140·8	For 8 Do. 1925–32.
13 Waverly	2·4	0·4	1·2	4·1	4·5	28·1	45·4	21·3	10·2	10·3	7·8	3·5	139·2	For 11 Do. 1920–30.
14 Pachamalai	0·7	0·6	1·1	4·9	7·3	24·1	41·2	25·9	10·9	10·8	5·3	1·3	134·1	
15 Ayyarpadi	0·4	0·5	1·4	4·8	8·9	24·9	35·7	25·3	12·7	9·8	5·8	1·6	131·8	For 9 years only from 1924–32.
16 Naduar	0·6	0·8	1·3	4·5	7·8	22·6	37·9	25·6	10·7	11·3	5·8	1·1	130·0	
17 Upper Paralai	0·3	0·7	1·5	4·8	7·8	23·5	36·0	24·5	12·5	10·2	6·1	1·8	129·7	For 9 years from 1924–32.
18 Lower Paralai	0·2	0·6	1·4	4·8	7·7	23·6	36·7	25·2	11·2	9·9	5·4	1·2	127·9	For 11 Do. 1922–32.
19 Selaldiparai	0·5	0·4	1·6	5·0	7·6	23·2	38·9	24·0	9·5	9·9	4·7	1·2	126·5	
20 Puthutota	..	..	..	..	..	..	..	..	..	..	..	..	126·3	The monthwar rainfall is not given.
21 Urlikal	0·3	1·1	1·6	5·9	9·1	24·5	27·2	24·1	11·1	10·9	5·6	1·4	122·8	For 6 years from 1927–32.
22 Stanmore	0·5	0·5	1·5	4·9	7·2	22·4	37·8	22·9	9·5	9·5	4·7	1·0	122·4	
23 Villoni	0·2	0·6	1·3	5·3	7·2	20·9	30·6	25·1	12·6	10·3	5·9	1·6	121·6	For 12 years from 1921–32.
24 Palakadavu	..	..	..	6·4	14·9	21·3	19·8	17·5	19·0	11·9	3·8	1·4	116·0	For 9 months from April 1933 to December 1933. Before April raingauge was not maintained.
25 Valparai	0·5	0·4	1·1	4·7	6·6	20·7	32·3	25·2	9·2	9·2	4·9	1·2	116·0	
26 Waterfall	0·6	0·5	1·2	4·6	5·3	20·8	17·9	14·0	8·6	9·3	6·9	5·5	95·2	For 8 years from 1925–32.
27 Anapadi	0·3	0·1	0·5	2·8	9·6	7·8	14·1	13·0	6·9	9·9	6·4	2·4	73·8	For 4 Do. 1929 (June) to 1933 (May).
28 Mount Stuart (Tunacadavu)	3·9	1·2	0·7	4·2	2·4	10·7	19·1	9·8	2·2	5·6	6·6	3·2	69·6	For 8 Do. 1920–27.
29 Topslip	0·4	1·1	0·4	2·6	6·0	8·0	10·2	12·2	4·7	9·2	6·1	3·3	64·2	For 5 Do. 1928–1932.
30 Gundrao	0·9	0·3	0·3	2·3	11·5	7·3	6·6	4·9	4·3	12·9	5·8	4·8	61·9	For 4 Do. 1929 (June) to 1933 (May).
31 Sethumadai	0·3	0·2	0·6	1·7	2·0	6·2	8·6	4·4	2·0	6·8	5·7	1·9	40·4	
32 Eshelamthorai	0·3	0·3	0·6	2·4	3·2	2·5	0·7	0·6	1·0	7·2	6·2	3·7	28·7	For 9 years from 1924–32.
33 Kallapuram	0·5	0·2	0·9	0·9	1·2	2·3	0·3	1·0	1·7	5·3	6·3	7·7	28·3	For 4 years, but for the months September, October and November only for 3 years and for the month of December only for 2 years.
34 Chinnar (Travancore)	0·4	0·2	0·2	1·3	2·1	1·3	1·3	1·6	1·3	5·0	5·1	4·1	23·9	For 7 years from 1926–32.
35 Kombu	0·8	0·1	0·6	1·7	0·5	1·7	0·4	0·9	1·4	5·1	3·9	3·5	20·6	For 9 years but for the months of February, May, June, September and October only for 8 years and for the months of November and December only for 7 years.

11. The greater part of the rain falls during the south-west monsoon which usually bursts in the first week of June. It is preceded by thunder showers of short duration in the months of April and May: but it rains almost every day during the months of June, July and early August, when the monsoon is in full swing. Being close to the sea, the full strength of this monsoon is felt in these forests, and heavy rain results from it. A couple of inches of rain an hour is common in these sudden bursts. The central range of hills extending from north-west to south-east partially arrests the force of the monsoon and prevents it from reaching the north-eastern parts of the tract, which in consequence only receive a little rain from the clouds that escape through the Palghat gap, or through passes here and there on the hills. The south-west monsoon loses its intensity by the end of August and there is a lull in the rain during September.

12. The north-east monsoon winds blow from October to December, and being far removed from the Bay of Bengal, the rain is not very intense except occasionally. The total rainfall received from this monsoon during the period is comparatively small, and its force is almost completely arrested by the central range of hills which lie at right angles to the direction of the monsoon. The map below illustrates the variations of rainfall in the locality :—

MAP SHOWING THE INTENSITY OF RAINFALL IN THE SOUTH COIMBATORE FOREST DIVISION

SCALE 1" - 4 MILES



By T. J. ACHARY
WORKING PLANS FORESTER
9-6-1954

WORKING PLANS OFFICER,
SOUTH COIMBATORE DIVISION.

13. *Climate.*—Consequent on these large variations of annual rainfall, and of elevation and aspect, the climate is highly variable. Three distinct climatic zones are noticeable. The south-western slopes of the hills with an annual rainfall of over 150 inches (mainly the planting areas around Valparai) have a moist tropical climate typical of the west coast of the Indian Peninsula, grading at higher elevations into a sub-tropical climate. The north-western corner of the tract (mainly facing the Palghat gap), with an annual rainfall of about 50 inches has a tropical monsoon climate. The north-eastern slopes of the hills, with an annual rainfall of about 25 inches, have a dry tropical climate.

14. At the foot of the hills, the shade temperature varies from 75 degrees F to 100 degrees F, the daily variation being about 25 degrees F. The lowest and the highest day temperatures recorded in Coimbatore are 85 degrees F and 102 degrees F in the months of December and April respectively and the night temperatures during these months were 65 degrees F and 85 degrees F respectively. At higher elevations temperatures are lower. Frost is unknown in the locality.

15. The humidity of the air in the planting district is generally high, being about 80 per cent in summer, and it touches the saturation point during the monsoons. Over the rest of the area it grades down to a dry 35 per cent.

16. The locality is feverish at times. In the planting districts the unhealthy season is from February to May: but in the drier localities the season is at its worst during the months of July to September.

17. In localities receiving a rainfall of more than 80 inches in the year, mainly in the planting areas, leeches are common. Generally they are active from May to December, but they are to be found at all times alongst moist stream banks. Consequently inconvenience from leechbite adds to the general unhealthiness of the locality.

SECTION 5.—WATER-SUPPLY.

18. Except in the dry north-eastern parts of the area almost all streams are perennial. The streams flowing through the dry tracts of the locality also take their source from the higher hills and even in summer the bigger streams contain water. There is no scarcity of water in any of the camps.

SECTION 6.—DISTRIBUTION AND AREA.

19. The reserves dealt with form a compact block of hills about forty miles to the south of Coimbatore. The following statement shows the names of the reserves in the whole division, and the areas covered by the present working plan.

Statement of reserved forests in South Coimbatore Forest Division.

Name of reserve. (1)	Date of reservation. (2)	Authority for reservation. (3)	Area as noted on S.I. Map. (4)	Disreservations made or proposed. Area in acres. (5)	Date of disreservation. (6)	Authority for disreservation. (7)	Purpose of disreservation. (8)	Area of the reserve on 31st March 1934 (Cols. 5 to 6). (9)	Area covered by Mr. Lauries working plan. (10)	Area covered by this working plan (Cols. 10 to 11). (11)
					TUNACADAVU RANGE.					
Tunacadavu	18th December 1883.	G.Os. No. 1612, dated 2nd August 1879 and No. 760, dated 3rd July 1880 and Notification No. I, dated 27th November 1883.	10,403·00	3,803·00	27th September 1927.	Notification No. 241, dated 27th July 1927 and G.O. No. 1244, Development, dated 18th March 1927.	Granted for cultivation held on long leases by the Planters in Anaimalais.	..	..	..
				226·00	..	G.O. Ms. No. 322, dated 15th March 1933.	Wrongly disreserved in Notification No. 241, dated 27th July 1927.	..	..	..
				87·00	1st September 1933.	Notification No. 300, dated 22nd August 1933.	The area has been assigned for cultivation of plantation products.	6,739·00	6,739	Nil.
Tekkadi leased forest ..	Do.	G.O. No. 936, Rev. (Special), dated 26th December 1918.	15,059·00	..	..	....	....	15,059·00	15·059	Nil.
					ULANDI RANGE.					
Tunacadavu	Do.	G.Os. No. 1612, dated 2nd August 1879 and No. 760, dated 3rd July 1880 and Notification No. I, dated 27th November 1883.	14,790·00	..	..	....	....	14,790·00	12,648	2,142·00
Anaimalai	1st March 1885.	G.O. No. 1382, R.D., dated 15th December 1884 and Notification No. 16, dated 15th December 1884.	14,065·00	..	..	....	....	14,065·00	Nil.	14,065·00
					POLLACHI RANGE.					
Tunacadavu	18th December 1883.	G.Os. No. 1612, dated 2nd August 1879 and No. 760, dated 3rd July 1880 and Notification No. I, dated 27th November 1883.	7,002·00	..	..	....	....	7,002·00	Nil.	7,002·00
Tekkadi leased forest ..	Do.	G.O. No. 936, Rev. (Special), dated 26th December 1918.	1,158·00	..	..	....	....	1,158·00	Nil.	1,158·00
Anaimalai	1st March 1885.	G.O. No. 1382, R.D., dated 15th December 1884 and Notification No. 16, dated 15th December 1884.	22,096·29	..	..	....	....	..	..	..
	1st May 1914 ..	G.O. No. 842, Revenue, dated 17th March 1914.	8·56	No. I addition to Anaimalai Reserve Forest.						
	15th August 1916.	Notification No. 332, dated 19th June 1916.	39·17	Avarakodipallam addition.						
	Do.		12·22	Vairanshola addition.						
	Do.		3·10	Addition to Anaimalai Reserve Forest (S.F. No. 201 of Kottur).						
				24·80	1st January 1925.	G.O. Mis. No. 1997, dated 21st November 1924.	The area was disreserved to benefit neighbouring cultivators.	..	..	..
			—	6·24	..	Erratum Notification No. 329, dated 8th November 1924.	Wrongly disreserved in G.O. Mis. No. 1997, dated 21st November 1924.	..	..	..
				0·78	1st August 1928.	G.O. No. 781, R. D., dated 2nd September 1901 and Notification No. 191, dated 21st June **1928.**	The areas contain buildings which have been sold to the Anamalai Ropeway Company, Limited.	22,140·00	Nil.	22,140,00

PUNACHI RANGE.

	1st March 1885.	G.O. No. 1382, Revenue, dated 15th December 1884, Notification No. 16, dated 15th December 1884 and Notification No. 2, dated 26th December 1918.	102,126·96	303·09	Andiparai or Mary Estate addition.		....	..	..	..
	15th January 1902.	Notification No. 385, dated 2nd September 1901.								
				234·00	1st January 1918.	Notification No. 519, dated 22nd November 1917.	Disreserved to form Anaimalai Township and control of the Township transferred to Revenue Department.	..	..	..
				— 29·25	..	Erratumnotification G.O. Mis. No. 322, Development, dated 15th March 1933.	Wrongly disreserved in Notification No. 519, dated 22nd November 1917.	..	..	..
				35,058·30	27th September 1927.	G.O. No. 1244, Development, dated 13th August 1927 and Notification No. 241, dated 27th July 1927.	Granted for cultivation held on long leases by the Planters in Anamalais.	..	..	..
				22·00	Do.	Do.	Granted for house-site held on long leases by the Planters in Anamalais.	..	..	..
				850·28	Do.	Erratum notification, dated 28th February 1933 to Notification No. 241, dated 27th July 1927.	Granted for cultivation purposes held on long leases by the Planters in Anaimalais.	..	..	..
				236·00	30th March 1934.	Notification No. 106, dated 12th March 1934.	The area is surrounded by Estates on Ryotwari tenure and granted for cultivation.	..	..	..
				7,299·55	1st September 1933.	Notification No. 300, dated 22nd August 1933.	The area has been assigned for cultivation of plantation products.	58,759·17	Nil.	58,759·17
Punachi	18th December 1883.	G.Os. No. 1612, dated 2nd August 1879, No. 760, dated 3rd July 1880 and Notification No. 1, dated 27th November 1883.	3,140·70	..	..	....	....	3,229·08	Nil.	3,229·08
	15th May 1916 ..	G.O. No. 527, Revenue, dated 8th March 1916 and Notification No. 16, dated 15th December 1884.	88·38							
					UDAMALPET RANGE.					
Anamalai	1st March 1885 ..	G.O. No. 1382, Revenue, dated 15th December 1884 and Notification No. 16, dated 15th December 1884.	65,151·47	5·95	1st June 1923 ..	Notification No. 104, dated 10th April 1923.	Near Kallapuram. It was disreserved to allow the cultivators of adjoining patta lands access for watering cattle.	65,145·52	Nil.	65,145·52
Amaravati	Do. ..	Do.	33,350·00	204·00	15th January 1926.	G.O. No. 1758, Development, dated 7th December 1925 and Notification No. 362, dated 14th November 1925.	A portion of Thalinji block required for extension of cultivation.	..	..	..
				25·00	15th February 1927.	G.O. No. 1794, dated 20th December 1926 and Notification No. 403, dated 6th December 1926.	The land was granted to Pulayars for wet cultivation.	33,121·00	Nil	33,121·00
Dhalli	15th October 1896.	Notification No. 382, dated 19th June 1896.	639·08	..	..	....	....	639·08	Nil.	639·08
Manjampatti	..	....	3,564·00	..	..	....	....	3,564·00	Nil.	3,564·00
Kukkal	..	....	10,739·00	..	..	....	....	10,739·00	Nil.	10,739·00
Kudiraiyur Block ..	..	....	2,533·00	..	..	....	....	2,533·00	Nil.	2,533·00
Total ..	..	....	306,272·02	47,589·17	..	....	....	258,682·85	34,446	224,236·85

REMARKS.—The areas of Tunacadavu reserved forest and Tekkadi leased forests shown in column (10) have been computed from 1″ = 1 mile Stock and Management map by Square Method.

SECTION 7.—STATE OF THE BOUNDARIES

20. The external boundaries of the reserves are cleared lines with numbered stone cairns planted at sufficiently close intervals so that from any one point the adjacent two cairns are visible. The maintenance of these boundaries is generally satisfactory. The boundaries of the reserves that border the States of Cochin and Travancore are either natural features or cleared lines 18 feet wide: there is no periodical inspection to be done of these boundaries, and their verification has been prescribed by Government in G.O. No. 190, Political, dated 10th April 1922, at the revenue resettlement of the district.

21. The internal boundaries between reserves and enclosures, or between reserves and the disreserved areas of the Anamalai Estates are not cleared throughout, but have survey stones planted along them.

22. The reserved forests were topographically surveyed in the season of 1890 to 1893 on the scale of 4 inches to a mile. The areas of the reserves in the statement in paragraph 19 have been furnished from the register of reserves maintained in the District Forest Office.

SECTION 8.—LEGAL POSITION.

23. All the reserves are the absolute property of the State, having been settled under section 16 of the Madras Forest Act.

SECTION 9.—RIGHTS AND CONCESSIONS.

24. The rights admitted at settlement are mainly rights of way, rights to cut channels and take water from streams in the reserves, and rights of access to temples within the reserve: all these rights find place in the settlement notifications. There are no rights to forest produce which affect the management.

25. As a concession the District Forest Officer allows jungle tribes such as Kaders, Muduvars and Pulayars to live within the reserve and practise cultivation over limited areas, with the main object of having conveniently located labour colonies within the reserve. These concessions are withdrawable at any time, and are renewed from year to year, or allowed to lapse. Such cultivation is allowed only in the inferior forests, and is restricted to definite areas.

CHAPTER II.—THE FOREST.

SECTION 1.—COMPOSITION AND CONDITION OF THE FOREST.

26. *General.*—The area dealt with consists of zones of rainfall from 20 to about 300 inches in the year, of altitudes from 1,200 to 8,200 feet above sea level, and has a variable aspect. In each zone the soil varies from bare out-crop of gneissic rock to soil composed of its products of disintegration. The cumulative effect of these oecological and edaphic factors are noticeable on the vegetation where it has not been altered by human agencies.

27. In a general way the types of tree growth can be classed into the following three categories :—

(i) the tropical evergreen forest,
(ii) the deciduous monsoon forest
(iii) the deciduous scrub jungle closely allied to the tropical savannah type of vegetation.

28. The elevation of the locality sets no limit to forest tree growth: even on the highest hills some tree growth—mainly rhododendrons—is to be found. Due however to exposure, poor soils, fire or other causes, the tops of most of the hill ranges are covered by a growth of grass with patches of tree growth along water courses and hill sides where they merge into the dense tropical evergreen forests of the valleys.

29. *The tropical evergreen forest.*—This type of vegetation once covered an area of about 146·5 square miles, forming a continuous stretch of forest between elevations of 1,500 and 5,000 feet. Consequent on the disreservation of about 73·8 square miles of forest for planting purposes, the extent of the type has dwindled to about 72·7 square miles and now consists of isolated blocks.

30. This "rain forest" has a rich and varied flora, and most of the important species are included in the list given in Appendix IV. The preponderant species in the top canopy of the forest are *Mesua ferrea*, *Poeciloneuron indicum*, *Cullenia excelsa*, *Dichopsis elliptica*, *Hereteria papilio*, *Eugenia* spp., *Calophyllum* spp., *Dysoxylum malabaricum*, *Cedrela Toona*, *Artocarpus integrifolia*, etc. On the south side of the Kalar there is preponderance of either *Mesua ferrea* or *Pœciloneuron indicum*: the latter affecting the more damp situations or valleys with a heavier rainfall. In other sholas the species are very much more mixed.

31. In the course of the preparation of the working plan an enumeration of the more important species was carried out. The species enumerated are listed in paragraphs 32 *et seq* below, and of these all trees of and above a B.H. girth of three feet were enumerated. The enumeration revealed that in the best forest a two-acre plot contained a stand of 76 trees of *Mesua ferrea* of and above three feet in girth, with the younger age classes well represented. A similar two-acre plot in a dense *Poeciloneuron indicum* stand contained 85 of these trees of and above three feet in B.H. girth, the younger age classes in this also being well represented. These are only in the best localities: the average stand contains about half the number.

32. Accessory species abound, and especially noteworthy in the second storey are *Elæocarpus tuburculatus*, *Elæocarpus scriratus*, *Eœocarpus munroii*, *Kurrimia indica*, *Mastixia arborea*, *Pygeum* spp., *Meliosma* spp., *Litsaea* spp., *Cryptocarya wightiana*, *Holigarna* spp., *Chrysophyllum roxburghii*, etc.

33. In the understorey are to be found among others *Laportea crenulata*, *Macaranga* spp., *Psychotria* spp., *Pavetta* spp., *Eugenia argentea*, etc.

34. Of monocotyledons *Arenga wightii*, *Pandanus furcatus*, *Calamus* spp., *Ochlandra rheedii*, *Elettaria cardamomum*, *Curcuma* spp., and *Musa* spp., are common.

35. *The deciduous monsoon forest.*—The vegetation of this type consists mainly of teak and its associates such as *Dalbergia latifolia*, *Terminalia tomentosa*, *Terminalia paniculata*, *Pterocarpus marsupium*, *Grewia tiliæfolia*, *Adina cordifolia*, *Stephegyne parvifolia*, *Albizzia odoratissima*, *Schleichera trijuga*, *Stercospermum chelonoides*, and *xylocarpum*, *Anogeissus latifolia* and *Dillenia pentagyna*. *Bambusa arundinacea*, the thorny bamboo, is abundantly present and in places even excludes other vegetation.

36. *The deciduous scrub jungle.*—The species in this type of vegetation are mainly *Anogeissus latifolia*, *Hardwickia binata*, *Albizzia amara*, *Azadirachta indica*, *Acacia leucophlœa*, *Acacia arabica*, *Zizyphus* spp., *Tamarindus indica*, *Carissa carandas*, *Protium caudatum*, *Balsamodendron berryi*, *Cochlospermum gossypium*, *Sterculia urens*, *Givotia rottleriformis*, *Moringa pterygosperma*, *Gyrocarpus jacquini*, etc., Bamboos—*Bambusa arundinacea* and *Dendrocalamus brandisii*—occur along the streams.

37. The extent of the various types of vegetation over the working plan area is indicated in the following statement :—

Statement showing the areas in acres of the vegetational types in the ranges of the South Coimbatore Forest Division.

Name of range. (1)	Area in acres. Shola. (2)	Deciduous fuel forest. (3)	Deciduous timber forest. (4)	Sandal area. (5)	Grass and rock. (6)	Reed. (7)	Total area columns (2) to (7)]. (8)
Punachi ..	27,494	2,426	3,317	Nil.	18,342	653	52,232
Pollachi ..	646	22,714	1,363	Nil.	3,859	Nil.	28,582
Udamalpet ..	9,178	58,633	Nil.	454	55,452	Nil.	123,717
Ulandi	9,229	Nil.	4,358	Nil.	2,426	Nil.	16,013
Total ..	**46,547**	**83,773**	**9,038**	**454**	**80,079**	**653**	**220,544**

38. *Natural regeneration.*—In the evergreen forest natural regeneration is generally prolific. The seeds germinate freely, but due to the absence of the requisite conditions for the promotion of the growth of the seedlings they do not all survive. In a mixed forest of this kind with a varied flora, nature's tendency to cause a change in the composition of the flora is noticeable. Under the dense canopy of the trees only the more shade bearing species survive, and very commonly one notices the advanced growth to be different from the dominant species in the crop. Such a tendency is specially noticeable with *Dichopsis elliptica* which establishes itself in dense shade, gradually tending to replace the *Mesua ferrea* stand in an undisturbed crop.

39. To test the extent of natural regeneration in the forest a thorough enumeration of seedlings, advanced growth and poles of important species was made over two plots of 16 acres each, and the following results were obtained :—

Results of enumeration of natural regeneration in a block of evergreen forest in the Kal-Ar valley.

Serial number. (1)	Area of plot. (2)	Species. (3)	Seedlings, and saplings, up to 12″ B. H. Girth. (4)	Advance growth of poles in B.H. girth classes. 12″ to 18″. (5)	18″ to 24″. (6)	24″ to 30″. (7)	30″ to 36″. (8)	Total of columns. (5) to (8) (9)
1	80 chains by 2 chains = 16 acres. Strip No. A. 46—48 A East ..	Mesua ferrea	1,130	124	110	62	71	367
		Poeciloneuron indicum ..	270	4	4	2	4	14
		Cedrelata Toona	..	1	..	..	..	1
2	80 chains by 2 chains = 16 acres. Strip No. 46—48 A West ..	Mesua ferrea	570	73	62	38	52	25
		Poeciloneuron indicum ..	296	9	8	6	..	23
		Cedrela Toona	..	1	1	2	2	6

40. The plots were chosen at random, but the results reveal that whilst there is abundant natural regeneration in the forest, the mortality in the very young age classes is great.

41. In the deciduous forests natural regeneration is generally inadequate. Rank growth of grass, lantana or other weeds, which are found over most of the area, prevent the promotion of regeneration except in the few favourable localities where such influences are non-existent.

42. *Distribution of age classes.*—In the evergreen forest, enumeration revealed the distribution of the age classes of the valuable species to be generally satisfactory. The following statement indicates the number of trees in the various girth classes reduced proportionately for 10 trees of each species in the 7–8 feet girth class. The statement shows that with shade bearing species such as *Dichopsis elliptica* the younger age classes are more abundantly represented than the rest :—

Statement of the number of trees in the age classes reduced to 10 trees in the 7′—8′ girth class—Evergreen Working Circle—Kal-Ar Felling Series—Punachi Range.

Serial No.	Species.	Breast height girth classes in feet. 3'–4'.	4'–5'.	5'–6'.	6'–7'.	7'–8'.	8'–9'.	9'–10'.	10'–11'.	11'–12'.	Over 12"
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	Mesua ferrea	22·4	19·8	15·5	12·4	10·0	5·7	2·4	1·6	0·8	0·02
2	Poeciloneuron indicum	16·1	13·1	10·1	9·6	10·0	8·3	4·4	4·7	3·0	0·20
3	Dichopsis elliptica	56·1	50·1	34·8	18·1	10·0	3·8	1·2	0·7	0·2	0·01
4	Cedrela Toona	9·3	9·0	9·3	9·3	10·0	6·3	5·6	5·0	3·4	1·80
5	Dysoxylum malabaricum	10·0	6·9	8·5	7·7	10·0	2·3	0·7	0·0	0·0	0·00
6	Calophyllum species	7·9	9·9	9·2	8·9	10·0	6·5	3·5	2·4	1·4	0·30
7	Artocarpus integrifolia	15·0	20·9	15·6	13·1	10·0	5·4	1·8	1·2	0·6	0·30
8	Hereteria papilio	20·5	19·6	16·6	13·0	10·0	6·7	2·9	2·2	1·3	0·90

43. In the deciduous forest there is defective representation of the valuable species in the younger age classes. In a mixed deciduous forest as at Punachi one notices that the younger age classes are mainly of inferior species such as *Grewia tiliæfolia* and *Anogeissus latifolia.*

44. *Undergrowth.*—In the shola forest, the forest floor is generally clear of dense undergrowth. The commoner species are canes (Calamus species), screwpine (*Pandanus furcatus*), Cardamoms (*Elettaria cardamomum*), and *Strobilanthes* spp. Patches of reeds excluding all other vegetation are occassionally found.

45. *Lantana.*—In the deciduous forests lantana is a pernicious weed. Its habitat is mainly in regions with a rainfall of at least forty inches a year, or in localities, where any reduction in this rainfall is made up by an increase in elevation. Around Sethumadai and at Punachi lantana is exceedingly rapid in its spread, establishing itself in places with even the least opening in the canopy. Around Pundi and Mavadap it is spreading fast and suppressing everything within its reach.

SECTION 2.—INJURIES TO WHICH THE CROP IS LIABLE.

46. *Frost* is unknown in the locality.

47. *Wind* generally causes no abnormal injury to the trees. Occasional windfalls of trees occur during the monsoons when stormy cyclonic conditions prevail : it is not a preventable injury as the direction of the wind is uncertain.

48. *Fire.*—Within the evergreen forest fire never occurs, but where evergreen forest adjoins grassland damage from fire is considerable. The grass on hill tops very frequently gets burnt during the summer, and when a fire sweeps over tall grass it scorches the fire-tender species along the margins of the evergreen forest.

49. In the deciduous forests fires cause considerable damage. Severe fires which have damaged standing trees have not been known in recent times, though in the past they have left their impress on standing trees. Ground fires, which burn out the grass and litter, and scorch the young growth and bark of trees, occur during the hot weather in spite of the efforts made to prevent them. The following statement gives a summary of such fires as have been recorded in the recent past. All the fires are stated to be ground fires :—

Statement showing fire occurrence in the Working Plan area.

Years.	Udamalpet Range. Anamalai reserve. Number.	Anamalai reserve. Area in acres.	Amaravati reserve. Number.	Amaravati reserve. Area in acres.	Pollachi Range. Anamalai reserve. Number.	Anamalai reserve. Area in acres.	Tunacadavu reserve. Number.	Tunacadavu reserve. Area in acres.	Punachi Range. Anamalai reserve. Number.	Anamalai reserve. Area in acres.	Punachi reserve. Number.	Punachi reserve. Area in acres.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1926	3	53	..	..	5	307	4	118	2	35	..	..
1927	16	899	..	..	13	1,003	5	280	..	..	1	70*
1928	14	336	..	..	2	60	4	490	..	..	..	..
1929	16	224	..	..	7	110	2	250	1	25	..	..
1930	12	648	..	..	11	252	1	100	6	76	2	93*
1931	10	434	2	1,210	8	460	5	674	2	18	1	1 *
1932	7	209	..	..	22	371	..	..	4	37	..	..
1933	17	684	1	350	37	1,042	11	273	..	..	1	3 *

NOTE.—*Denotes fires in reserves which are fire-protected.

50. *Causes of fires.*—Most of the fires are no doubt intentional and are caused by incendiaries with the object of promoting the growth of fresh grass for grazing or of facilitating the collection of minor forest produce, or burning the litter into ash so that with the first rain the fields below the hills may receive water rich in manurial ingredients. Not a few fires are caused by negligence through failure to take sufficient precautions in lighting the way through the forest at night, or in smoking bees out of their hives.

51. *Offences.*—Illicit removal of forest produce accounts for much of the degraded condition of the forests on the outer slopes. Timber, fuel and bamboos are removed stealthily by the people of the villages adjoining the forests. That the number of offences shows no signs of diminution is apparent from the following statement of forest offences in the tract :—

Statement of forest offences in the locality.

Year.	Grazing.	Timber transit rules offence.	Illicit felling and removal.	Miscel-laneous.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
PUNACHI RANGE.					
1920–21	..	..	3	1	4
1921–22	2	..	16	..	18
1922–23	4	..	18	..	22
1923–24	2	..	7	2	11
1924–25	3	..	1	..	4
1925–26	1	..	3	..	4
1926–27	..	..	10	2	12
1927–28	..	..	6	..	6
1928–29	..	..	5	3	8
1929–30	..	..	3	2	5
1930–31	1	..	2	1	4
1931–32	..	..	..	1	1
1932–33	..	..	..	..	..
1933–34	6	..	1	13	20
POLLACHI RANGE.					
1920–21	14	35	68	37	154
1921–22	15	5	41	22	83
1922–23	8	12	72	24	116
1923–24	9	..	87	19	115
1924–25	20	..	71	16	107
1925–26	20	3	141	24	188
1926–27	16	1	108	29	154
1927–28	10	..	86	26	122
1928–29	5	..	60	8	73
1929–30	10	1	98	2	111
1930–31	5	..	86	10	101
1931–32	10	1	86	13	110
1932–33	8	1	95	10	114
1933–34	8	..	102	11	121
UDAMALPET RANGE.					
1920–21	24	..	52	8	84
1921–22	19	..	55	13	87
1922–23	29	2	80	15	126
1923–24	18	..	70	9	97
1924–25	38	1	81	10	130
1925–26	44	..	111	19	174
1926–27	27	..	114	23	164
1927–28	34	..	129	29	192
1928–29	27	3	91	14	135
1929–30	17	3	78	14	112
1930–31	4	4	25	11	44
1931–32	35	2	63	13	113
1932 33	23	1	77	21	122
1933–34	73	..	21	18	112

Weeds.

52. *Grass.*—The rank growth of grass on certain ridges, adjacent to the evergreen forest, makes the extension of the tree growth a slow process. The grass very frequently gets burnt, and damages all young regeneration as well as many of the older trees that may be within its reach. Nature's slow efforts at re-afforestation thus get a set back year after year. In the deciduous forests coarse elephant grass establishes itself in many places where openings in the canopy appear and where fires are frequent, fires having a marked effect in causing deterioration in the type of grasses that occur. In the midst of such grass natural regeneration has little chance of establishing itself, and when it does so it is almost inevitably destroyed by some subsequent fire.

53. *Lantana.*—In deciduous forests, with a rainfall of over 40 inches in the year, lantana is a menace. Where the canopy is close lantana does not thrive, nor has it established itself in localities with a rainfall of less than 40 inches in the year unless the reduction in rainfall is compensated for by an increase in the elevation of the locality. It appears to thrive best at an elevation of about 2,000 to 3,000 feet. In cleared areas within such a zone, lantana establishes itself as a dense impenetrable thicket 10 feet and more in height in two years time and it suppresses almost all seedling regeneration of tree species.

54. *Creepers.*—Herbaceous and woody climbers are common. In the evergreen forest immense woody climbers such as *Entada scandens*, *Spatholobus* spp. *Gnetum scandens*, *Aganosma cymosa*, *Bauhinia* spp., bind trees together, and constrict their growth. Canes, and occasionally *Heptapleurum racemosum* develop an epiphytic habit, but do little damage.

55. *Insects.*—There is no extensive damage by insects. *Hyblœa puera* and *Haphalia machoeralis* are found on teak trees, but the damage is not serious.

56. *Animals.*—Elephant and Bison are found in the area. The forests beyond the Torakadavu-Ar, around Pundi and Mavadap, are the permanent abode of many of these animals, but they do no great damage in this open and comparatively useless forest.

57. *Vermin* such as porcupine, flying fox and monkeys damage the fruits and seeds of trees. In the evergreen forest with a thick layer of humus seeds do not get embedded in the soil, and when germination takes place the cotyledons are attacked by vermin resulting often in the destruction of the young seedling.

58. *Miscellaneous.*—For some yet unkown reason it is found that *Mesua ferrea* develops unsoundness in the timber when it gets old. The age at which this begins is uncertain. In the exploitation of *Mesua ferrea* it has been found that trees which look quite sound externally, often prove to be hollow when felled, so that quite a number of them have to be rejected. Details of the number of unsound trees are not on record for all fellings in the past : but in the year 1931–32, the felling registers show the following percentage of unsound trees. The incidence of unsoundness may be expected to vary from one area to another, and these figures cannot therefore be taken to apply to the whole of the evergreen forests in the division.

Statement showing incidence of unsoundness in Mesua ferrea.

Particulars.	Number of trees in breast height girth classes.										
	7'–8'.	8'–9'.	9'–10'.	10'–11'.	11'–12'.	12'–13'.	13'–14'.	14'–15'.	15'–16'.	16'–17'.	Total over 7 feet.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Number of trees marked for felling ..	213	141	104	84	69	34	15	11	10	1	**682**
Number rejected as unsound	76	44	29	23	24	12	5	3	4	1	**221**
Percentage of unsoundness	35·7	31·2	27·9	27·4	34·8	35·3	33·3	27·3	40·0	100·0	**32·4**

NOTE.—This statement is from the felling register of 1931–32, for other years records do not show proper entries.

59. The incidence of hollowness does not appear to follow any specific rule : the inadequate data may account for the uncertain trend in the incidence. When fellings are done in future it is prescribed in Part II that correct data be collected for making a study of this defect.

CHAPTER III.—UTILIZATION OF THE PRODUCE.

SECTION 1.—AGRICULTURAL CUSTOMS AND WANTS OF THE POPULATION.

60. At the Census of 1931, the population of the revenue taluks within which these forests lie was found to be as follows :—

Name of taluk.	Area.	Population			Population per sq. mile
		Male.	Female.	Total.	
(1)	(2)	(3)	(4)	(5)	(6)
	SQ. MLS.				
Pollachi	692	1,46,304	1,43,129	2,89,433	418
Udamalpet	566	83,634	86,798	1,70,432	301

The present " Anamalai Hills village " was only constituted in December 1932 out of the planting areas of the Anamalai hills which were in Pollachi taluk.

61. About 23 per cent of Pollachi and 35 per cent of Udamalpet taluks consist of Government reserve forests, mainly the area herein dealt with. The extent of private forests in these taluks is practically negligible, and the population is largely dependent on these forests for their requirements of all kinds of forest produce. In addition, people in the remoter Dharapuram and Palladam taluks, and in other districts such as Trichinopoly and Tanjore on the east are dependent on these forests for some of their requirements.

62. Agriculture is the main industry of the people in the tract, and methods of cultivation are much the same as are in dry localities with a low rainfall. Along streams irrigated crops—mainly paddy, and sugarcane—are raised; and two crops of paddy in the year are commonly raised. Such areas are remote from the reserves, and there is no demand for manure leaves.

63. Crops irrigated by water lifted from wells are also raised, and the electrification of rural areas is giving a stimulus to this practice. It is not, however, expected that in the near future the practice will create any demand for manure leaves from the reserves.

64. Rainfed crops are raised once in the year almost anywhere : such crops are cholam, ragi and other cereals, ground-nuts and gingelly amongst oil-seeds, and cotton. These crops are raised by cultivation of what seem dry stony soils : the repeated weeding and soil aeration following on a burning of the debris on the area, and occasional manuring by penning cattle in the fields provide the necessary plant nutriment. Rotation of crops also plays a prominent part in this system of dry cultivation.

65. *Cultivation.*—To a limited extent, cultivation is practised within the reserves by the indigent hill tribes—Muduvars, Pulayars and Kaders. At one time they carried on such cultivation extensively, but subsequent to reservation the habit has been considerably restricted. For the privilege of being allowed to practice cultivation as a concession, these tribes provide forest labour. Ragi is the chief crop. The forest growth is cut, often leaving the big trees pollarded, and allowed to dry before the end of February. The first burning is done early in March and heaping and re-burning of the material is done before the end of March. The grain is sown in the middle of April, and the soil lightly raked to mix the ash with the soil and to cover the seed. The germination is complete by the middle of May. All the coppice regrowth is then cut back and a thorough weeding is done by the end of May pulling out all the weeds with their roots, a very important operation before the commencement of the monsoon. During the middle of August all coppice shoots are cut back, and a weeding is also done towards the end of August when there is a break in the monsoon. Between September and October the grain is harvested.

66. There are no timber-using industries of importance in the locality. Timber for pakka house construction and for furniture is mainly obtained from the deciduous forests of Mount stuart, the working plan for which provides for a steady annual supply of about 60,000 cubic feet of teak logs, 5,000 cubic feet of rosewood logs and about 110,000 cubic feet of miscellaneous timber. The best of this is stocked at the Government depot at Pollachi, and the rest is sold in the forest. Most of the timber is exported by purchasers to other districts, and it has been found that the markets have not, during the recent years of depression, been absorbing all the timber thus available, so that fellings have been restricted.

67. For the construction of temporary houses, or small sheds, poles of teak and other miscellaneous species, and bamboos are in demand. The Mount Stuart forests supply now not less than 12,000 teak poles a year from thinnings, in addition to a fair amount of bamboo and the rest is obtained from the forests of Pollachi and Udamalpet ranges. That considerable quantities of poles and bamboos as also fuel are brought from the adjoining Kollengode forests of Malabar indicates that the demand is in excess of the local supply : about 300 cart-loads are brought into Pollachi every week.

68. Fuel is in great demand not only for domestic purposes but also for a number of mills which exist between Pollachi and Udamalpet ginning cotton, or preparing groundnuts and paddy for the market. The demand from the mills has been till now steadily on the increaose; but the electrification of the tract is decreasing this demand. The demand the fuel for domestic consumption is, however, sure to continue. In the smaller villages, the fuel demand is met very much by cotton or cholam stalks supplemented considerably by illicit felling from the reserves. Rigid protection will increase the demand for fuel from coupes.

69. A limited amount of charcoal for the use of metal craftsmen, and for domestic consumption as fuel, is in demand in Pollachi and Udamalpet towns. The demand is adequately met from the fuel and dead bamboos converted in the coupes leased in the locality, and also from the adjoining forests of Kollengode.

70. *Grazing.*—The people need grazing for their cattle; but only those living in the Pollachi and Udamalpet taluks are immediately interested in grazing in the reserves. In the year 1931, the total number of cow units in these two taluks were 231,276, but only 9,158 of these were licensed to graze in the reserved forest. Of the total area of the two taluks 71·5 per cent is non-reserve, and 28·5 per cent is reserve, and the cow units grazed in the non-reserve portions was 96 per cent and that grazed in the reserve was 4 per cent of the total number.

71. Taking only villages adjoining the reserve, or within a distance of five miles from the boundary, the total number of cow units which grazed in the year 1931 was 63,414. Of this number only 9,158, or about 14 per cent were licensed to graze within the reserved forest. Grazing does not, therefore, constitute a serious danger to these forests, but, on the other hand, there would appear to be scope for an increase in the number of cattle licensed to graze within the reserves. Even the complete closure of the reserves to grazing would affect only 14 per cent of the cattle within a range of 5 miles of the reserves, or 4 per cent of the total number of cattle in the two taluks. Closure of small areas to grazing for a limited period of years can, therefore, cause no inconvenience worth mentioning.

SECTION 2.—MARKETS AND MARKETABLE PRODUCTS.

72. Pollachi is the central market for all products, and the weekly shandy on Thursdays is a great event attended by buyers and sellers in thousands. The agricultural produce from within a circle of about 50 miles radius is sold in the shandy and other products taken back in exchange. The number of carts that leave the shandy laden every week is usually about 3,500. Pollachi is consequently a popular place as a depot for all forest produce, and almost any of it can be purchased there at all times. Next in importance is the shandy at Udamalpet on Mondays to which place produce is largely drawn from Pollachi. Almost all forest produce bought by contractors is stored for sale at Pollachi, or Udamalpet.

73. Pollachi being a junction of the South Indian Railway system forms also a central distributing station from which produce is railed to other districts situated further away from the forests.

74. The timber demands in Pollachi market, and in the tract generally have been dealt with exhaustively in Master's " Notes on some of the Indian Markets for Madras Timbers " published in 1930, and in Laurie's " Revised Working Plan for the Mount Stuart forests of South Coimbatore division," published in 1933.

75. Timber from the remoter evergreen forests, which are comparatively unknown and are, anyway, difficult to season, are not very popular in the Pollachi timber market. *Mesua ferrea* as sawn railway sleepers, and on a small scale sawn scantlings of other species such as *Cedrela Toona* and *Dichopsis elliptica* are in demand, but prices have in the last two years made it unremunerative to exploit such timber.

76. Bamboos, fuel and minor forests produce of all kinds are generally marketted by contractors. The list of minor forest products collected in the locality are given in paragraph 382.

77. Grass is removed in headloads and cart-loads to a limited extent : its removal is now allowed free.

78. For the removal of miscellaneous materials such as stones, brake poles, and hutting and other materials, for purely local consumption, the following permits are stocked. The issue of such permits and removal of the produce is regulated by the District Forest Officer.

Statement of material sold on permits.

	RS.	A.	P.
(1) Shed materials for one shed	7	8	0
(2) Agricultural implement for one	0	1	0
(3) Firewood per headload	0	1	0
(4) Odai leaves	0	0	3
(5) Reeds	0	0	3
(6) Chiselled stone per cart-load	0	2	0
(7) Rough stone per cart-load	0	1	0
(8) Earth, gravel and metal per cart-load	0	0	6
(9) Brake pole, for one	0	2	0

SECTION 3.—LINES OF EXPORT.

79. All forest products from the locality have to pass through Pollachi or Udamalpet, which are the chief markets in the locality whence their further export is arranged.

80. The Chinnar-Udamalpet road, a distance of about 18 miles from the Travancore boundary, leading from the planting districts of the Munnar hills of Travancore is the main line of export for all the produce from Udamalpet range. This is a good metalled road maintained by the Public Works Department.

81. The Sethumadai-Pollachi road (15 miles) and the Valparai-Pollachi road (39 miles) serve for the transport of produce from all the other ranges of the division, namely Pollachi, Punachi and Tunakadavu. The former is maintained by the District Board, and the latter by the Public Works Department, and both are metalled roads. The latter road is maintained chiefly for the benefit of the tea planters who have extensions of the road into their estates.

82. All roads and paths made by the planters may be used by officers of the forest department, and by forest contractors, in accordance with the terms under which the lands were granted.

Should timber be transported by or on behalf of the Forest Department over any such road or path, a contribution towards its maintenance shall be paid to the planters the amount of which shall be decided by agreement between the Forest Department and the planters or failing such agreement by the Collector of the district.

83. Feeder roads within the reserved forests are maintained by the Forest Department, and a list of them is given in paragraph 179. Such roads or village cart-tracks go practically into the coupes to be worked for forest produce on the outer slopes. Prescriptions for the extension and maintenance of such feeder roads are embodied in this plan.

84. For the better protection of the forests, Timber Transit Rules approved by Government and published in the Forest Manual apply to the area. Within the tract all movement of timber is subject to check and such timber, whether from Government forests or from private lands or depots, has to be accompanied by permits in approved form.

SECTION 4.—METHODS OF EXTRACTION AND THEIR COST.

85. Under the permit system, there have been extensive fellings of timber, fuel and bamboos since 1868. Consumers and petty vendors took out permits and exploited the best of what was allowed to be removed, a system which is still in force in the adjoining private forests of Malabar.

86. The earliest attempt at regulation was when the working plan for the Ayerangal Fuel Working Circle was introduced in 1895. This working plan definitely prescribed departmental extraction and sale of fuel and bamboos, a system which was continued till even after 1908. Latterly working was entrusted to contractors who paid a lump sum to the department for the coupes sold to them : this system is now the rule with respect to all extraction of fuel, bamboos and minor forest produce in the whole of the area under consideration.

87. The departmental extraction of timber was also the system when timber fellings were commenced in Pollachi range early in 1900 to 1902, and it is still the system in the timber areas in Punachi. Trees are felled and logged departmentally, and dragged to roadside depots or carted to Pollachi and sold at periodical auctions.

88. The system of getting contractors to fell, convert and transport timber on behalf of the department on any large scale was introduced with respect to the sleeper supply from Kal-Ar valley in 1930. Trees for felling and conversion are selected, marked and numbered by the department. Tenders are called for to ascertain the lowest rate at which contractors would be prepared to fell and log the marked trees, and saw sleepers of approved specifications out of them and deliver them at the roadside depot, under departmental supervision. The department bestows the contract on the person who offers the most favourable terms. The sleepers are passed by the Range Officer at the roadside depot, and then their transport to Pollachi is arranged. At Pollachi the Forest Utilization Officer passes the sleepers on behalf of the railways, rejecting such of them as are unfit for laying in the track.

89. The contractor imports skilled labour from Malabar making advances to them and keeps them engaged throughout the year. Trees are felled, and logged into convenient lengths : without any assistance by elephants the logs are manœuvred on to temporary saw-platforms erected conveniently for each tree at the site, a proceeding made somewhat easy by the natural slope of the forest. The sleepers are made slightly over the standard size to allow for wear and tear in dragging. Drag holes are cut at one end, and with improvised drag ropes made out of canes, coolies drag the sleepers to a central depot on the roadside ready for passing and payment by the Range Officer. This method of working on contract has been found very successful in the locality from the year 1930, prior to which the operations were carried out departmentally by the saw mills and extraction divisions.

90. *Cost of extraction.*—The following statement gives the cost of extraction of sleepers from the Kal-Ar valley. The rates paid in the earlier years were high : there has been

some reduction in recent years, represented not only in the smaller cash payment but also in the considerably increased difficulty of extraction from remoter areas.

Statement of costs of extraction of broad-gauge sleepers from Kal-Ar Valley.

Year. (1)	For conversion and delivery at road side depot. (2)	Carting to Pollachi. (3)	Total cost per broad-gauge sleeper. (4)
	RS. A. P.	RS. A. P.	RS. A. P.
1926–30	2 6 6	2 4 0	4 10 6
1930–31	2 7 6	2 4 0	4 11 6
1931–32	2 7 0	1 12 0	4 3 0
*1932–33	2 10 0	1 10 0	4 4 0
†1932–33 (latter half)	2 6 0	1 10 0	4 0 0

* Before the construction of Poo-Ar road.

† After the construction of Poo-Ar road.

91. For metre-gauge sleepers payment is generally at about 50 per cent of the above rates.

92. Felling of timber when extracted from the deciduous forests, as at Punachi, is usually paid for at the following rates :—

Felling and conversion into round, 9 pies per cubic foot.

Felling and conversion into squared, 1 anna 4 pies per cubic foot.

Conversion of spokes and felloes and delivery at roadside in the forest, Rs. 5 per set of 24 spokes and 12 felloes.

Carting from roadside to Pollachi depot, Rs. 3–8–0 per set of 24 spokes and 12 felloes.

93. For extraction of fuel from the coupes of Udamalpet range contractors usually pay about Rs. 1–4–0 per ton for felling, stacking and trimming of the stumps. In the case of coupes situated on slopes, as in Dhalli, a sum of 8 annas is paid for transporting a ton of fuel to the cart-track. The carting to Udumalpet is paid for at about Rs. 2–8–0 per ton, 50 per cent extra being paid for transport from Dhali and Amaravati coupes where the road is not throughout good, and involves about five miles of village tracks. The selling price varies with quality, but is about Rs. 7 per ton.

94. In Pollachi range, in almost all the fuel series felling and stacking of the fuel is paid for at about Rs. 1–4–0 per ton, and carting to Pollachi costs about Rs. 4–4–0 per ton. Only in the Pachthanni coupes does the contractor pay an extra four annas for felling and stacking on account of the comparative inaccessibility of the locality. The selling price is variable, but averages about Rs. 10 per ton.

95. In Udamalpet range, for felling and delivery of bamboos about 100 of which go to the cart, payment is at 1 anna per bamboo. Split bamboos are paid for at 4 annas per ten pieces; about 400 splits go to the cartload. The transport to Ulamalpet costs about Rs. 3–8–0 per cartload. The selling price is about Rs. 15 per cartload.

96. In Pollachi range a flat rate of Rs. 5 is paid per cartload of bamboos, and Rs. 4–4–0 is paid for carting to Pollachi. The selling price is usually about Rs. 10 per cartload.

SECTION 5.—PAST AND PRESENT PRICES.

97. The price of all timber in the locality is regulated with respect to the prices prevailing at Pollachi, a full statement of which is to be found in paragraphs 137 to 150 of Laurie's Revised Working Plan for Mount Stuart forests of South Coimbatore (1931).

98. For *Mesua* sleepers supplied to the railways free on rail there have been considerable reductions in the prices paid in recent years, as indicated in the following statement :—

Year. (1)	Price per broad-gauge sleeper. (2)	Price per metre-gauge sleeper. (4)
	RS. A. P.	RS. A. P.
1925–26	9 0 0	3 0 0
1926–27	9 0 0	3 0 0
1927–28	9 0 0	3 0 0
1928–29	8 8 0	3 0 0
1929–30	8 8 0	3 0 0
1930–31	8 4 0	3 0 0
1931–32	7 12 0	3 2 0
1932–33	5 2 6	2 5 0

99. Fuel is now extracted and sold only by contractors. The prices to be paid by the purchaser for fuel at Pollachi and Udamalpet vary considerably according to the season and demand : but in the last two years the ruling average prices have been about Rs. 10 per ton at Pollachi and Rs. 7 per ton at Udamalpet. The following statement gives the details of the prices paid by the contractors for the coupes they have purchased in the last few

years. The contractors' accounts are sometimes inaccurate: that occasionally unhealthy competition influences the prices to a great extent is an additional factor which contributes to the uneven trend in the prices :—

Statement of prices obtained for fuel coupes in the South Coimbatore Forest Division.

Name of fuel series and coupe number.	Year of working.	Details of sale.				
		Area in acres.	Net price of coupe.	Yield from coupe. Tons of fuel or timber.	Net price per acre.	Net price per ton of fuel at the coupe.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			RS. A.	T. Q.	RS. A.	RS. A.
		Pollachi range.				
Pothamadai coupe IV ..	1924–25 ..	34·50	2,130 0	258 40	60 0	8 4
Do. V ..	1925–26 ..			Not sold.		
Do. V ..	1926–27 ..	39·85	1,115 13	412 0	28 0	2 11
Do. VI ..	1926–27 ..	34·16	1,229 12	486 40	36 0	2 8
Do. VII ..	1927–28 ..	44·77	1,209 0	622 68	27 0	1 15
Do. VIII ..	1928–29 ..	33·00	2,508 0	285 40	76 0	8 13
Do. IX ..	1929–30 ..	36·30	2,613 10	654 34	72 0	3 15
Do. X ..	1930–31 ..	30·00	2,250 0	586 38	75 0	3 13
Do. XI ..	1931–32 ..	33·00	2,376 0	345 20	72 0	6 14
Do. XII ..	1932–33 ..	31·50	1,953 0	764 11	62 0	2 9
Do. XIII ..	1933–34 ..	39·30	2,358 0	1,113 26	60 0	2 2
Gudaravalli coupe IV ..	1924–25 ..	28·00	560 0	95 0	20 0	5 14
Do. V ..	1925–26	..		Not sold.		
Do. V ..	1926–27	31·00	217 0	189 66	7 0	1 2
Do. VI ..	Do. ..	35·30	350 0	393 0	10 0	0 12
Do. VII ..	1927–28 ..	30·86	1,142 0	305 40	37 0	3 12
Do. VIII ..	1928–29 ..	12·00	900 0	195 40	75 0	5 10
Do. IX ..	1929–30 ..	27·00	1,539 0	379 54	57 0	4 1
Do. X ..	1930–31 ..	32·50	2,437 8	548 20	75 0	4 7
Do. XI ..	1931 32 ..	32·20	2,254 0	257 36	70 0	8 12
Do. XII ..	1932–33 ..	40·00	1,280 0	1,737 35	32 0	0 12
Do. XIII ..	1933–34 ..	38·60	868 8	595 50	22 8	1 7
Ayerangal coupe IV ..	1924–25 ..	65·25	2,088 0	567 0	32 0	3 12
Do. V ..	1925–26 ..	28·13	1,715 15	406 11	61 0	4 4
Do. VI ..	1926–27 ..	20·00	520 0	276 30	26 0	1 14
Do. VII ..	1927–28 ..	37·32	1,866 0	597 73	50 0	3 2
Do. VIII ..	1928–29 ..	36·00	3,636 0	758 71	101 0	4 13
Do. IX ..	1929–30 ..	40·00	2,600 0	738 0	65 0	3 8
Do. X ..	1930–31 ..	42·25	4,647 8	830 0	110 0	5 10
Do. XI ..	1931–32 ..	44·70	2,279 11	401 26	51 0	5 11
Do. XII ..	1932–33 ..	44·00	1,584 0	746 4	36 0	2 2
Do. XIII ..	1933–34 ..	31·90	1,212 3	711 0	38 0	1 11
Pachathanni coupe III ..	1932–33 ..	29·00	2,030 0	1,160 20	70 0	1 12
Do. IV ..	1933–34 ..	43·50	2,218 8	386 0	51 0	5 12
N.B.—No coupe was sold in Pachathanni fuel felling series from 1924–25 to 1931–32.						
Kottur coupe IV ..	1924–25 ..	31·00	341 0	142 40	11 0	2 6
Do. V ..	1925–26 ..			Not sold.		
Do. VI ..	1926–27 ..	36·18	1,085 6	825 47	30 0	1 5
Do. VII ..	1927–28 ..	52·65	3,422 4	1,638 0	65 0	2 1
Do. VIII ..	1928 29 ..	22·50	1,710 0	913 20	76 0	1 14
Do. V ..	Do. ..	44·42	577 7	77 40	13 0	6 3
Do. IX ..	1929–30 ..	50·30	3,370 2	931 0	67 0	3 10
Do. X ..	1930–31 ..	46·00	3,726 0	1,173 10	81 0	3 3
Do. XI ..	1931–32 ..	54·00	1,282 8	525 18	23 12	2 7
Do. XII ..	1932–33 ..	65·65	656 8	1,245 25	10 0	0 8
Do. XIII ..	1933–34 ..	43·00	903 0	622 46	21 0	1 7
Nal-Ar coupe I ..	1929–30 ..	37·20	344 2	167 41	9 4	2 1
Do. II ..	1930–31 ..	27·50	247 8	133 50	9 0	1 14
Do. III ..	1931–32 ..	26·65	59 15	71 52	2 4	0 13
Do. XV ..	1932–33 ..	28·75	100 10	316 74	3 8	0 5
Do. XVI ..	1933–34 ..	26·00	130 0	548 4	5 0	0 4
Keerapadi coupe I ..	1932–33 ..	21·00	882 0	1,232 39	42 0	0 11
Do. II ..	1933–34 ..	19·75	1,580 0	875 0	80 0	1 13
		Udamalpet Range.				
Amaravati	1924–25 .. } 1925–26 .. }			Not sold.		
Amaravati coupe V ..	1926–27 ..	51·40	638 0	279 30	12 8	2 5
Do. VI ..	1927–28 ..	52·85	1,096 10	101 36	20 12	10 13
Do. VIII ..	1927–28 ..	57·00	641 4	258 32	11 4	2 8
Do. VII ..	1928–29 ..	75·00	1,275 0	204 0	17 0	6 4
Do. IX ..	1928–29 ..	74·00	1,221 0	259 28	16 8	4 11
Do. X ..	1929–30 ..	50·00	1,050 0	260 72	21 0	4 0
Do. XI ..	1930–31 ..	47·25	614 4	391 56	13 0	1 9
Do. X ..	1930–31 ..	20·50	276 12	88 62	13 8	3 3
(Supplemental area.)						

Statement of prices obtained for fuel coupes in the South Coimbatore Forest Division—cont.

Name of fuel series and coupe number.		Year of working.	Details of sale. Area in acres.	Net price of coupe	Yield from coupe. Tons of fuel or timber.	Net price per acre	Net price per ton of fuel at the coupe.
(1)		(2)	(3)	(4)	(5)	(6)	(7)
				RS.	T. Q.	RS. A.	RS. A.
			Udamalpet Range—cont.				
Amaravati coupe	XII	1931–32	68·00	833 0	229 0	12 4	3 10
Do.	XIII	1932–33	76·50	1,147 8	512 6	15 0	2 4
Do.	XIV	1933–34	75·80	947 8	695 31	12 8	1 6
Kamanuthu coupe	V	1925–26	69·84	1,361 14	250 38	19 8	5 7
Do.	VI	1925–26	98·00	3,430 0	592 40	35 0	5 13
Do.	VII	1926–27	98·20	2,896 14	617 0	29 8	4 11
Do.	VIII	1927–28	84·00	1,869 0	596 14	22 4	3 2
Do.	IX	1928–29	63·00	5,255 13	958 48	83 7	5 10
Do.	X	1929–30	96·75	3,870 0	949 66	40 0	4 8
Do.	XI	1930–31	84·50	3,380 0	749 34	40 0	4 8
Do.	XII	1931–32	87·50	2,712 8	1,101 8	31 0	2 7
Do.	XIII	1932–33	92·20	2,472 12	858 20	26 4	2 14
Do.	XIV	1933–34	96·60	2,511 10	708 57	26 0	3 9
Dhali coupe	IV	1924–25	64·18	1,316 13	424 24	21 4	3 3
Do.	V	1925–26	70·00	2,450 0	356 12	35 0	6 11
Do.		1926–27 1927–28 1928–29			No sale.		
Do.	XI	1929–30	40·00	370 0	448 44	9 4	0 11
Do.	XII	1930–31	52·50	735 0	373 14	14 0	1 15
Do.	XIII	1931–32	73·00	1,405 4	516 58	19 4	2 12
Do.	XIV	1932–33	66·85	1,270 2	408 27	19 0	3 2
Do.	XV	1933–34	76·20	914 6	569 41	12 0	1 10

100. The following statement gives the price paid by contractors to the department for such bamboo coupes as have been sold to them in the last few years :—

Statement of prices obtained for bamboo coupes in the South Coimbatore Forest Division.

Name of coupe.	Net prices obtained at sales. 1924–25.	1925–26.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
				UDAMALPET RANGE.						
Kurumalai, Pundi and Mavadap.	310	636	270	..	..	..	..	..	..	..
Thalingi Block, Coupe I ..	430	..	431	..	650	400	..	..	..	
II ..	..	..	..	..	..	..	660	..	..	860
III ..	..	..	..	..	..	..	..	245	516	
Thalingi and Vendayam Block ..	..	575	..	..	..	..	..	..	..	..
Mange—Ar.	..	..	428	505	..	..	..	..	..	..
Thalingi West Block	..	..	..	..	..	..	120	..	..	..
Pundi and Mavadap	..	..	..	..	..	..	..	140	..	..
Total for the range ..	**740**	**1,211**	**1129**	**505**	**650**	**400**	**780**	**385**	**516**	**860**
				POLLACHI RANGE.						
Pothamadai Coupe I ..	1,200	..	..	960	..	..	1,800	..	..	1,030
Do. II	..	..	355	..	855	..	..	350	..	..
Do. III	..	..	..	415	..	455	..	..	400	..
Ayerangal Upper Coupe I ..	630	..	..	675	..	..	840	..	..	750
Do. II ..	..	410	..	..	820	..	..	800	..	..
Do. III ..	..	..	315	..	..	530	..	..	675	..
Ayerangal Lower Coupe I ..	..	500	..	500	..	..	1,550	..	..	530
Do. II ..	..	..	350	..	620	..	..	750	..	..
Do. III ..	..	..	560	..	..	305	..	..	350	..
Pachathanni Coupe I	..	..	380	..	375	..	..	350	..	340
Do. II	..	..	205	..	1,000	..	..	1,210	..	..
Do. III	..	..	900	..	..	1,030	..	..	705	..
Villoni Coupe I	1,300	..	..	710	..	..	1,150	..	..	700
Do. II	..	1,325	..	..	1,000	..	..	1,375	..	..
Do. III	..	..	720	..	..	555	..	..	260	..
Thadaganachi Coupe I ..	660	..	..	500	..	..	1,455	..	..	660
Do. II ..	..	252	..	..	307	..	..	385	..	..
Do. III ..	..	..	355	..	..	180	..	..	405	..
Total of Pollachi range ..	**3,790**	**2,487**	**4,140**	**3,760**	**4,977**	**3,055**	**6,795**	**5,220**	**2,795**	**4,010**
				D PUNACHI RANGE.						
Punachi Working Circle	..	..	..	..	..	..	..	..	300	..
Grand total for the division ..	**4,530**	**3,698**	**5,269**	**4,265**	**5,627**	**3,455**	**7,575**	**5,605**	**3,611**	**4,870**

101. The following statement gives the prices obtained by sale of the right to collect the various items of minor forest produce :—

Statement showing the sale of minor forest produce (each unit separately) in the area covered by the working plan.

Serial number and name of unit. (1)	1924–25. (2)	1925–26. (3)	1926–27. (4)	1927–28. (5)	1928–29. (6)	1929–30. (7)	1930–31. (8)	1931–32. (9)	1932–33. (10)	1933–34. (11)
UDAMALPET RANGE.										
1 Kadukkai	452	1,000	1,110	840	1,840	1,600	1,725	500	1,313	1,005
2 Avaram bark	621	840	1,495	550	1,171	635	965	520	550	400
3 Konnai bark	..	..	..	..	..	..	..	303	..	78
4 Miscellaneous	2,026	2,378	1,460	1,106	1,202	1,100	1,275	1,210	2,000	1,385
Total ..	**3,099**	**4,218**	**4,065**	**2,496**	**4,213**	**3,335**	**3,965**	**2,533**	**3,863**	**2,868**
POLLACHI RANGE.										
1 Kadukkai	56	35	..	30	..	70	..	60	51	84
2 Konnai bark	..	..	..	..	..	..	..	..	No offers.	..
3 Miscellaneous	2,656	2,300	2,090	2,900	3,773	3,162	2,000	1,310	1,420	3,100
Total ..	**2,712**	**2,335**	**2,090**	**2,930**	**3,773**	**3,232**	**2,000**	**1,370**	**1,471**	**3,184**
PUNACHI AND ULANDI RANGES										
1 Kadukkai	..	..	..	..	..	..	..	..	50	.. *
2 Konnai bark	..	..	..	..	..	..	..	..	..	..
3 Miscellaneous	280	280	280	330	380	660	1,080	1,000	971	1,200
Total ..	**280**	**280**	**280**	**330**	**380**	**660**	**1,080**	**1,000**	**1,021**	**1,200***
Total revenue on M.F.P. in the division	**6,091**	**6,833**	**6,435**	**5,756**	**8,366**	**7,227**	**7,045**	**4,903**	**6,355**	**7,252**

* REMARKS.—Except in the year 1932–33 sale of gall-nuts also is included in this lease.

CHAPTER IV.—STAFF AND LABOUR SUPPLY.

SECTION 1.—STAFF.

102. It is difficult to assess correctly the time of the District Establishment spent in the administration of these forests, and therefore calculation of the portion of the cost of the District Establishment to be apportioned to this working plan can only be approximate. The Mount Stuart Working Plan has made no arguments in this direction, and has taken arbitrarily two-fifths of the District Establishment in making the financial forecast. The present practice in the division is to allot half the cost of the District Establishment for the administration of Tunacadavu range and one-eighth to Ulandi range, leaving a balance of three-eighths for this working plan area. A portion of Ulandi range is included within this working plan area : But it is the portion wherein no work except Minor Forest Produce collection by contractors is to be undertaken. Consequently in apportioning the cost of the District Establishment the present practice has been adhered to, and three-eighths of the cost of the District Establishment has been debited to this working plan area. This share of the cost is considered by the writer to be reasonable considering the relative intensity of the sylvicultural work contemplated under both the working plans. The following is a statement of the cost of the establishment engaged in the working plan area :—

Statement showing the staff employed and the cost for the area covered by the working plan in South Coimbatore Division.

Serial number. (1)	Details of staff employed. (2)	Number. (3)	Rate of pay. (4)	Present pay for the month. (5)	Pay for the whole year. (6)	Cost for the area of the working plan. (7)	Remarks. (8)
			RS.	RS. A. P.	RS.	RS. A. P.	
	A.—EXECUTIVE STAFF.						
1	Deputy Conservator of Forests ..	1	575—50—1,350	1,100 0 0	18,000		
			Overseas pay.	400 0 0	..		
2	Extra Assistant Conservator of Forests.	1	250—25—900	725 0 0	8,700	10,012 8 0	Three-eighth cost of items 1 and 2 is debited.
	POLLACHI RANGE.						
3	Ranger, Fifth Grade	1	80 to 225	125 0 0	1,500		
4	Forest Guard, Third Grade	4	15 to 24	72 0 0	864		
5	Forest Guard, Fourth Grade	4	15 to 24	60 0 0	720		
6	Forest Watchers	8	10	80 0 0	960		
	PUNACHI RANGE.						
7	Ranger, Fifth Grade	1	80 to 225	125 0 0	2,040		
			Special pay	45 0 0	..		
8	Forest Guard, Second Grade	1	15 to 24	21 0 0	252		
9	Do. Third Grade	1	15 to 24	18 0 0	216		
10	Do. Fourth Grade	1	15 to 24	15 0 0	180		
11	Do. Fourth Grade	4	15 to 24	60 0 0	..		
			Special pay ..	12 0 0	864		

Statement showing the staff employed and the cost for the area covered by the working plan in South Coimbatore Division—cont.

Serial number. (1)	Details of staff employed. (2)	Number. (3)	Rate of pay. (4) RS.	Present pay for the month (5) RS. A. P.	Pay for the whole year. (6) RS.	Cost for the area of the working plan. (7) RS. A. P.	Remarks. (8)
	A.—EXECUTIVE—*cont.*						
	UDAMALPET RANGE.						
12	Ranger, Fifth Grade	1	80 to 225	125 0 0	1,500	12,660 0 0	Whole cost of items 3 to 18 is debited.
13	Forest Guard, First Grade	1	15 to 24	24 0 0	324		
			Special pay	3 0 0	..		
14	Do. Second Grade	3	15 to 24	63 0 0	756		
15	Do. Third Grade	3	15 to 24	54 0 0	648		
16	Do. Fourth Grade	1	15 to 24	15 0 0	216		
			Special pay ..	3 0 0			
17	Do. Fourth Grade	3	15 to 24	45 0 0	540		
18	Forest Watchers	9	10	90 0 0	1,080		
	B.—OFFICE ESTABLISHMENT.						
	DISTRICT FOREST OFFICE.						
19	Head Clerk	1	70—4—90	90 0 0	1,080	2,481 12 0	Three-eighth cost of items 19 to 27 is debited.
20	Accountant	1	60 to 80	68 0 0	816		
21	Clerks	4	35 to 60	171 8 0	2,058		
22	Temporary clerk	1	35 to 60	35 0 0	420		
23	Typist	1	35 to 60	50 0 0	600		
24	Draftsman	1	35 to 60	60 0 0	780		
			Personal pay	5 0 0			
25	Peons	4	12 to 18	48 0 0	576		
26	Temporary peon	1	12 to 18	12 0 0	144		
27	Office watcher	1	12	12 0 0	144		
	POLLACHI RANGE.						
28	Clerk	1	35 to 60	50 0 0	600		
29	Peon	1	12 to 15	12 0 0	144		
30	Bungalow watcher	1	10	10 0 0	120		
	PUNACHI RANGE.						
31	Clerk	1	35 to 60	35 0 0	582	2,190 0 0	Whole cost of items 28 to 34 is debited.
			Special pay	13 8 0			
32	Peon	1	12 to 15	13 0 0	180		
			Special pay	2 0 0			
	UDAMALPET RANGE.						
33	Clerk	1	35 to 60	35 0 0	420		
34	Peon	1	12 to 15	12 0 0	144		
					Total ..	**27,344 4 0**	

SECTION 2.—LABOUR SUPPLY.

103. Labour supply is generally plentiful. Planters are the largest employers of labour in the tract and they draw their workmen from the districts in the plains. For all miscellaneous forest work a plentiful supply of Pulayars, Kaders and Malasars, who have been allowed to remain within the reserves are available. A list of such hill tribes is given below :—

Consolidated statement of hill tribes in the working plan area.

Locality. (1)	Name of tribe. (2)	Population. Men. (3)	Women. (4)	Children. (5)	Total. (6)	Remarks. (7)
	Udamalpet Range.					
Eshelthitu	Malasars ..	33	18	6	57	
Elumalayankoil	Do. ..	5	3	..	8	5·5 acres of land have been leased to them free for cultivation purposes under the usual terms.
Thalingi	Do. ..	120	68	68	256	
Sarakkupatti	Do. ..	16	14	3	33	
Kodanthur	Do. ..	30	33	4	67	
Aduvamuthampallam ..	Do. ..	6	6	..	12	
Erumacholai	Do. ..	10	10	..	20	
Odukampathiyur ..	Do. ..	20	9	5	34	
Pundi	Do. ..	44	19	9	72	
Erivalaivu	Do. ..	15	14	1	30	
Karumcholai	Do. ..	39	42	5	86	
Kurumalaipatti	Do. ..	40	30	7	77	
Vendayampatti	Do. ..	34	30	3	67	
Jallimuthampatti ..	Do. ..	8	8	2	18	
Thirumurthykoil ..	Do. ..	17	8	..	25	
	Pollachi Range.					
Sircarpathy	Malasars ..	33	30	41	104	39 acres given free for cultivation on annual lease under usual terms.

Consolidated statement of hill tribes in the working plan area—cont.

Locality.	Population.					Remarks.
	Name of tribe.	Men.	Women.	Children.	Total.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Punachi Range.			
Cinchona	Kaders ..	6	7	9	22	
Kallar	Do. .. } Muduvars .. }	23	19	20	62	25 acres of land leased free for cultivation.
Kavarkal	Kaders ..	28	19	18	65	
Ethakuly	Do. ..	5	6	11	22	
Kadamparai	Muduvars .. } Pulayars .. }	12 9	21	37	79	25 acres of land free for cultivation.
Lower Punachi	Do. ..	25	13	24	62	11 acres of land free for cultivation.
Attakatty	Do. ..	9	6	6	21	
			Ulandi Range.			
Ulandi	Muduvars ..	5	12	10	27	Frequently they shift to Cochin State. They practise shifting cultivation in the Government reserves.

104. For timber extraction, including such work as felling, sawing and hand dragging of sleepers, coolies from the adjoining Malabar district are always available. They are drawn mostly from Mannarghat taluk of Malabar district and are mainly Moplahs, a very faithful and hard-working people.

CHAPTER V.—PAST SYSTEMS OF MANAGEMENT.

SECTION 1.—GENERAL HISTORY OF THE FOREST.

A. History prior to reservation.

105. The district of Coimbatore and the parts of the adjoining Salem, Trichinopoly and Madura districts surrounded by the Nilgiris, Vellamalais, Anamalais, Bargur and Toppur hills, the Shevaroys, and the Pachamalais, form a compact block of plain country known as the Kongumandalam with a history of its own even from very early times. In common with other parts of India it has had vicissitudes of independence, and tutelage to more mighty neighbours, and a century of peaceful progress hardly escaped disturbance without the aggressive march of a greedy adventurer.

106. Antiquities with a prehistoric semblance are found in the tract; within the forests, Kistvaens or Pandavar-kulis—believed to be ancient sepulchres—built of cut stones or hewn slabs are commonly found, and some of notable importance exist at Pundi about 14 miles south-west of Udamalpet.

107. Finds of ancient Roman coins in the district, and references to the employment of Romans as slaves and soldiers by the then kings of Coimbatore indicate an export trade from very ancient times. From the time of the first Roman Emperor articles such as beryl, ebony, cinnamon, and other aromatics, peacocks and their feathers and other valuable products were exported, and paid for in gold.

108. Two trade routes between the west coast and the district are referred to: one of these was along the Amaravati valley. Prosperous colonies existed along these routes, and doubtless the forests were very much utilized.

109. Centuries of warfare between the Kings of Chera (Malabar), of Pandya (Madura) and of Pallava (Conjeeveram), the Gangas and the Cholas for the ascendancy of the one or the other were staged in this district. The Vijianagar dynasty gave peace to the land for about three centuries and with its fall, Mysore and Madura fell out, alternately waging war on each other in this district. Mysore held the district for the whole of the 18th centuary and from her the British conquered it in 1799, at the fall of Seringapatam.

110. At the time of British annexation the system of forestry in the tract was the unrestricted removal of all but teak, *Dalbergia latifolia* (rosewood), *Pterocarpus marsupium* (vengai), and sandalwood. Then started an area of wasteful extraction of teak and valuable timbers for the army and the navy.

111. In 1868, the Jungle Conservancy Department was formed, an overseer was appointed to be in charge of the forests in Udamalpet and Pollachi taluks with a sub-overseer at Dhali and a separate overseer for the collection of minor forest produce on the Anamalais. The moneygars of the adjoining villages were supplied with books of permits to be issued for all removal of forest produce. To cultivators, for their agricultural and domestic requirements, the permits were issued free but others had to pay the following fees :—

	Head-loads.	Cart-loads.
	RS. A. P.	RS. A. P.
Timber ..	0 1 0	1 4 0
Fuel ..	0 0 3	0 5 0
Bamboos ..	0 0 6	0 10 0

Under this system only dry fuel could be removed. There was no distinction between round or squared timber but teak, *Dalbergia latifolia* (rosewood), *Pterocarpus marsupium* (vengai), sandalwood, *Anogeissus latifolia* (vekkali), *Acacia sundra*, *Tamarindus indica* (tamarind), *Acacia arabica* (babul), and *Terminalia Arjuna* were not allowed to be removed. The duplicates of permits were sent to the taluk office for check and the originals were checked by the overseer in his rounds. Six tanadars were appointed to check the removals with the permits, and their number was increased to seven in 1874.

112. In 1872, the forests were handed over to the Collector who was then called Collector and Conservator of Forests.

113. In 1872, the issue of permits was entrusted to permit-issuing gumasthas, who were allowed a commission of 6¼ per cent on collections. The overseer was designated a Ranger, and the sub-overseer a Forester : and Forest Guards or Watchers were appointed.

114. In 1876–77, the price of fuel (green or dry) was raised to a rupee per cart-load but was reduced in 1878 to the old level, when also the issue of free permits to agriculturists was abandoned.

115. In 1882, the Forest Act was introduced, and reservation commenced afterwards.

B. History after reservation.

116. Between 1883 and 1885, most of the forests in the division were notified as reserves; and in 1885–86, Rangers were appointed for both Pollachi and Udamalpet.

117. In 1886, presumably under the permit system, a contract for the removal of valuable timber such as *Dalbergia latifolia* (rosewood), *Pterocarpus marsupium* (vengai), and *Anogeissus latifolia* (vellanagai)—from Navamulai valley was given to a timber merchant. No details are now ascertainable, but that the operation was extensive seems certain from the fact that timber was skidded down extensively from Punachi to Navamulai and then carted to Pollachi.

118. Grazing in the forests was free till 1888; restrictions were introduced from this year prohibiting goat browsing, and charging annas 8, 4 and 2, per buffaloe, cow and sheep respectively.

119. In 1888–89 fire protection of forests was introduced, and Dhali reserve and an area of about 10,000 acres between Pothamadai and Pachathanni on the outer slopes of Pollachi range were first fire-protected from this year.

120. In 1898–1900, Ribbentrop, the Inspector-General of Forests, visited the forests in Madras and advised Government on the necessity for the preparation of working plans; and in 1900 a Working Plan Officer was appointed for each forest circle.

121. After reservation of the forests was complete, planters got interested in the best forests of the Anamalais, and in 1896, the Forest Officers' opinion that the forests on the Cochin side of the watershed on the Anamalais might be abandoned for coffee cultivation was obtained. In 1896, Government approved the grant of leases of the forest for plantation purposes, and since then the policy has been steadily pursued resulting in the allotment for clearing of about 47,232 acres of reserve for planting purposes. The area has been disreserved since 1926, and excluded from administration by the Forest Department.

122. In 1927, an area of 23,000 acres of reserve in the Kal-Ar valley was set apart for the use of the Government Cinchona Department, for planting cinchona. An area of about 1,300 acres has been planted up till now; whether or not any further planting should take place has not been definitely decided at present.

SECTION 2.—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

123. Till now there has been no consolidated working plan for the whole forest division; parts of the area still remain not covered by any working plan. Working plans for blocks of forest in some localities, constituting them into working circles, have however been in force for various periods.

A. Evergreen forests.

124. There have been no working plans for the management of the evergreen forests. Since reservation the policy has been to disreserve them steadily for plantation purposes.

125. The earliest attempts to market timber from the evergreen forests were during the years 1903 to 1905. Felling of timber was undertaken in Andiparai shola near Iyerpadi about 35 miles away from Pollachi. The timber was partly carted to Anamalai village departmentally, and an attempt was made to sell it there. The quantity recorded as felled was as follows :—

		C.FT.
Mesua ferrea	(Suruli)	14,721
Calophyllum tomentosum	(Poonspar)	7,237
Dysoxylum malabaricum	(White cedar)	3,611
Artocarpus integrifolia	(Wild jack)	828
Cedrela Toona	(Red cedar)	1,111

126. Mesua was mainly felled in the form of young poles for pit props for supply to the Kolar mines. The operations were a failure ending in loss to the Government, and were consequently abandoned. No attempt appears to have been made to supply Mesua railway sleepers, although during the years 1901–02 the department supplied teak sleepers to the railway for the extension of the line from Calicut to Tellicherry.

127. The assignment of shola forests for plantation purposes was on condition that timber was not sold by the planters but could be made use of on their own land for their own purposes. Much timber was therefore felled on the estates and allowed to be wasted and ultimately used as fuel : some of the more valuable woods have been utilized for building purposes on the estates.

128. Between the years 1925 and 1928, the Logging Engineering Division " cruised " the area by American methods, carrying out valuation surveys, and preparing topographical maps for part of the Kal-Ar valley, with a view to carrying out intensive exploitation of timber from the area. However the survey valuations and maps were found to be unreliable, as estimating had been carried too far, being extended in some cases, even to the names of the species.

129. The clearing of shola forests for planting of cinchona by Government drew attention to the possibility of utilization of the timber and accordingly in 1926–27 as an experimental measure 6,000 Broad Gauge sleepers were converted and supplied to the railway at Pollachi by the Logging Engineer. The operation was a success and it was decided to continue the work more extensively. The work was conducted by the Forest Engineering Division between 1927 and 1930, and was handed over to the District Forest Officer for continuance from 1931. The operation was discontinued from 1933 as the prices paid by the railways for the sleepers supplied were so reduced as to make working unremunerative.

Statement showing the area worked, number of sleepers extracted, the cost incurred on converting and transporting them to Pollachi depot, revenue realized by sale and profit or loss.

Serial number.	Year.	Area worked.	Number of trees marked.	Number of trees felled and converted.	Number of Broad Gauge sleepers obtanied.	Number of Metre Gauge sleepers obtained.	Cost of extraction of sleepers.	Revenue by sale of sleepers.	Profit or loss in the year.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
							RS. A. P.	RS. A. P.	RS. A. P.	
1	1926–27 ..	Sleeper operation to begin with was confined to area already cleared by Cinchona Department. Hence no enumeration was possible. The area gone over from 1926–31 is approximately 1,750 acres.			6,020	1,415	25,087 15 6	38,367 0 0	13,279 0 6	The sales were conducted by the Forest Engineering Branch.
2	1927–28 ..				11,165	1,514	50,978 15 6	81,372 10 0	30,393 10 6	
3	1928–29 ..				11,792	926	57,190 0 0	18,570 10 0	61,380 10 0	
4	1929–30 ..	.. ..	..	.. ..	17,757	1,073	85,846 1 0	22,679 14 0	36,833 13 0	
5	1930–31 ..	1,300			10,850	4,968	61,253 1 0	1,47,093 11 0	+85,840 10 0	
6	1931–32 ..	350	1,541	1,000	10,248	5,124	52,574 6 0	91.695 0 0	+39,120 10 0	
7	1932–33 ..	350	1,912	944	11,466	3,201	55,532 10 0	1,58,420 0 0	+1,02,887 6 0*	* Revenue realised in 1933–34 is also included for 1932–33 as there was no extraction in the latter year.
	Total for seven years	..	..		**79,298**	**18,221**	**3,88,463 1 0**	**7,58,198 13 0**	**+3,69,735 12 0**	

130. The following statement gives an abstract of the work carried out. The cost does not include the cost of establishment maintained for the purpose :—

131. In the above statement the revenue shown each year is not by the sale of the year's outturn only. Actually balances of stock and outstandings of revenue were carried forward from year to year. Consequently each year's profits or loss is not correctly indicated. The total figures for the seven years are however the result of the complete sale of all the sleepers including rejections and represent the result the result of the sleeper operations over the whole period. It shows a profit of Rs. 4–3–0 per Broad Gauge sleeper unit.

132. In addition to the extraction of railway sleepers, timber from *Dichopsis elliptica* (pali), *Calophyllum tomentosum* (poon), *Cedrela Toona* (red cedar), *Dysoxylum malabaricum* (white cedar) were also felled on a small scale and sold in the market. The results of the operations are given in the following statement :—

Statement showing the proceeds of the sale of timber other than Mesua.

Serial number.	Year.	Name of species.	Number, class and size.	Volume of timber in c.ft.	Total cost incurred.	Amount (proceeds of sale).	Net profit excluding overhead charges.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					RS. A. P.	RS. A. P.	RS. A. P.	
1	1928–29	Pali	250 Kolmarams of 15′ × 7″ × 3½″.	638	1,038 1 4	1,889 8 0 (for 1 and 2)	122 4 0 (for 1 and 2)	The sales were conducted by the Forest Engineering Branch. (for 1–4)
2	1928–29	Do.	500 Chattams of 10′ × 7″ × 3″.	729$\frac{1}{6}$	729 2 8			
3	1929–30	Red cedar	....	2,205	2,480 10 0	Figures not available. (for 3 and 4)		
4	1929–30	White cedar	....	299	336 6 0			
5	1930–31	Red cedar	....	1,944	2,187 0 0	2,376 0 0	189 0 0	
6	1931–32	Do.	....	2,139	2,406 6 0	2,997 12 0	591 6 0	
7	1931–32	Poon	....	160	180 0 0	..	..	
8	1932–33	Red cedar	8′ × 7″ × 5″	2,252	2,533 8 0	3,210 12 0	677 14 0	

133. The extraction in the earlier years was from land, cleared for planting up with cinchona, but later it has been from the adjoining forests earmarked for cinchona plantations.

134. *Regeneration.*—In all these years no artificial regeneration was attempted as the land was ultimately expected to be taken up for cinchona planting. There is therefore no record of results from which conclusions may be drawn.

B. Deciduous timber forests.

135. The deciduous timber forests of the division, which are worth mention, excluding those covered by the Mount Stuart Working Plan, are those around Punachi, Palakadavu and Thalingi : the latter two are inaccessible and the last is very inferior compared to the rest.

136. In 1906, a working plan for the Varigali valley prepared by Arbuthnot was sanctioned. Among other things, it constituted a Palakadavu Timber Working Circle—only to be protected—falling largely within the area of the present working plan. As the area is inaccessible the treatment prescribed continues.

137. In 1908, a working plan for Punachi and in 1909, a working plan for Thalingi, prepared by Arbuthnot was sanctioned. The former was worked with modifications till revised later. The latter was not worked : there was no market, the timber possibilities had been exaggerated, and the question of grazing had to be considered separately by Government.

138. Punachi reserve was notified in 1883, and though exploitation from the accessible localities has been taking place from 1904, the first working plan was the one sanctioned in 1908. This working plan mentions that till then 43 miles of fire lines had been formed in the working circle in addition to the departmental exploitation of timber. According to the working plan the treatment was to be as follows :—

(i) Selection fellings of trees over 6 feet B.H. girth, and of unhealthy trees over 4 feet 6 inches B.H. girth of teak, rosewood and *Pterocarpus marsupium* subject to a limit per compartment. The work was carried out, the yield limit was exceeded, and the work fell into arrears.

(ii) Improvement fellings in which all trees of other species interfering with the development of valuable stems were to be removed : this was discontinued after 1921–22, because it was a waste of time and money.

(iii) Regeneration fellings consisting of the removal of all inferior species likely to interfere with natural regeneration of valuable species for a distance of one chain around all living trees of valuable species coupled with the breaking up of the soil within this radius. In 1915–16 this was done at a cost of Rs. 319 over 197 acres of compartments 9 and 10, and as not a seedling could be counted, the work was given up.

139. These operations were found in 1925 to have made the forest a very open one: the fellings between 1904 and 1925 were as follows :—

Statement showing timber exploited from Punachi Working Circle from 1904 to 1925.

Locality. Compartment number.	Locality. Area in acres.	Year of exploitation.	Timber extracted in cubic feet.
(1)	(2)	(3)	(4)
I	146·80	1904–1906	29,950
III	130·30	1910–1911	6,852
IV	60·50	1911–1912	6,835
V	92·40	1913–1914	3,942
VI	174·06	1913–1914	204
VIII	80·80	1915–1916	3,302
IX and X	231·60	1915–1916	1,911
IX and X	..	1916–1917	1,584
XI	103·20	1917–1918	4,436
XIII	82·50	1918–1919	7,835
VIII	..	1918–1919	100
IX and X	..	1918–1919	310
XI	..	1918–1919	290
XII	124·50	1919–1920	10,263
VIII	..	1919–1920	262
IX and X	..	1919–1920	38
XI	..	1919–1920	411
XIII	..	1919–1920	1,262½
XII	..	1920–1921	3,834
XIII	..	1920–1921	410
II	194·80	1920–1921	34
XIV	67·75	1920–1921	17,175
XV	82·25	1921–1922	19,861
XIV	..	1921–1922	500
XVI	258·10	1922–1923	19,266
XII	..	1922–1923	637
XV	..	1922–1923	323
Road clearing	..	1922–1923	200
Total	**1,829·56**	**1904–1925**	**142,027½**

140. Artificial aid was to be given to the natural regeneration where necessary according to the working plan. In 1916–18, 24 plots of 2 chains square were selected by the late H. F. A. Wood, and cleared and dibbled with teak seed. In 1925, the operation was pronounced to be discouraging: but after years of neglect, and pressure by lantana all round, the plots still bear teak, some of which are now in good condition.

141. Between 1920 and 1925, an area of about 65 acres was cleared and burnt, and dibbled or sworn broad-cast with teak seed; of this an area of only about 38 acres was successful: the cost for the successful areas alone averaged about Rs. 30 per acre.

142. Weeding, uprootal of lantana, prohibition of grazing, and fire protection were also prescribed and carried out, though not persistently.

143. At the revision of the working plan in 1925, the verdict on the working of the 1908 plan was :—

> "Overcutting and reduction of stocking density, unwise retention of many unsound stems, waste of money on improvement fellings, on regeneration fellings, on weeding (of natural regeneration areas) and on attempted eradication of lantana, questionable expenditure on artificial regeneration, replacement of grass by undergrowth in many areas (this being mainly an advantageous result in providing a better soil covering), and the establishment, in some areas, of ever-green thicket (an adverse factor in that its presence precludes natural regeneration of valuable deciduous species)."

144. The present state of the successful teak plantations over about 38 acres and the 24 patches does not warrant such a gloomy picture though no doubt the cost has been somewhat high.

145. In 1925, a revised working plan for Punachi Working Circle was prepared by Mr. Coode. The exploitation programme of this working plan consisted of Selection Fellings of valuable species. The marking rules prohibited the removal of sound stems less than 6 feet B.H. girth, and no tree was to be felled if there was any silvicultural objection such as an undue opening of the canopy unlikely to fill up in a short time. Subject to the same silvicultural conditions, all exploitable dead and unsound immature tree were to be felled. A felling programme detailing compartments representing about five-sixth of the working circle was drawn up and the annual yield was approximately estimated and

given for guidance. Actually the yield was nearly four times what was estimated by the working plan, as indicated in the following statement :—

Statement showing timber estimated and extracted from Punachi Working Circle from **1926–1934.**

Locality. Compartment number. (1)	Locality. Area in acres. (2)	Year of exploita-tion. (3)	Timber estimated in cubic feet. (4)	Timber extracted in cubic feet. (5)
XIX	163·2	1927–1928	7,000	10,365
XX	140·5	1927–1928	9,000	34,383
XX	..	1928–1929	..	8,055
II	194·8	1928–1929	1,950	12,293
II	..	1929–1930	..	2,435
XX	..	1929–1930	..	40
V	92·4	1930–1931	2,450	11,069
VI-A	85·26	1930–1931	..	302
VII	97·6	1930–1931	2,810	10,513
VII	..	1931–1932	..	12,951
VIII	80·8	1931–1932	550	9,706
IX	133·2	1931–1932	2,490	10,045
XI	103·2	1933–1934	1,400	2,588
Total ..	**1,090·96**	**1926–1934**	**27,650**	**124,745**

146. Between 1908 and 1925, 142,028 cubic feet were extracted from 1,830 acres; whereas between 1925 and 1934, 124,745 cubic feet were extracted from 1,091 acres. It is therefore apparent that in working the 1925 plan, after condemning the 1908 working plan in the manner stated in paragraph 143 above, nearly the same quantity of timber was extracted in about half the period from less than two-thirds of the area. The danger from over-exploitation in the working circle seems therefore to be greater than ever, and grass and lantana are firmly established.

147. The regeneration operations contemplated by the 1925 working plan were somewhat on the lines of a Shelterwood system as follows :—

(i) In a period of 15 years a specified area of about 365 acres was to be treated under an intensive system of natural regeneration, coupes being worked annually :—

(*a*) Evergreen thicket undergrowth was to be felled in December and strewn evenly over the area, and burnt in February-March;

(*b*) thickets of lantana were to be burnt as late as possible every year;

(*c*) the roots of all rosewood in the area were to be wounded after the burn;

(*d*) re-burning in subsequent years, and the removal of the overwood was left to the discretion of the District Forest Officer;

(*e*) if annual late burning of dense lantana did not give satisfactory regeneration, lantana areas were to be given preference in the selection of further areas for treatment. In the treatment of lantana the District Forest Officer was to be guided by past experience; and

(*f*) after obtaining satisfactory regeneration, fire was to be rigidly excluded and annual weedings, climber cuttings, removal or lopping of species interfering with the valuable species, etc., were to be conducted to the extent necessary as and when required.

(ii) In the rest of the working circle where selection fellings are carried out :—

(*a*) the roots of all rosewood marked for felling were to be wounded;

(*b*) tending and creeper cutting were to be done for freeing all regeneration in the year after the fellings; and

(*c*) all dense thickets of lantana were to be burnt as late as possible.

(iii) Past attempts at artificial regeneration having proved the impossibility of establishing regeneration at reasonable cost, no measures were prescribed. But steps to secure or supplement regeneration were suggested if it was found necessary.

148. Of these elastic prescriptions, the late burning of lantana was discontinued as it was found to be ineffective in destroying that weed. In actual working, in addition to the thickets of evergreen undergrowth, all trees less than 2 feet in girth have recently been felled and burnt, and the bigger gaps have been dibbled with teak, *Pterocarpus marsupium* (vengai), and *Dalbergia latifolia* (rosewood), in addition to the root wounding of rosewood.

149. Some regeneration has been established, but the task of promoting it in a sea of lantana is found costly and difficult.

150. The following three statements indicate the financial aspect of the working of Coode's Working Plan of 1925 :—

Statement showing the net revenue realized in Punachi Working Circle under Coode's Working Plan.

Seria number.	Particulars of items.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1	By sale of— Timber	2,595 13 0	19,017 3 0	9,426 10 0	20,057 14 2	17,674 7 0	21,674 3 0	1,931 4 6	1,884 2 0
2	Spokes and felloes	525 0 0	1,528 14 0	240 0 10	310 0 0	405 3 9	1,192 8 0	..	..
3	Brake Poles	143 6 0	185 4 0	139 14 0	60 14 0	88 2 0	140 0 0	226 2 0	426 6 0
4	Shed materials and firewood ..	57 6 0	48 12 0	112 8 0	45 0 0	27 8 0	16 8 0	76 4 0	60 10 0
5	Grazing revenue	284 0 0	40 0 0	..	..	22 8 0	57 8 0	75 0 0	104 0 0
6	**Lease amount of Minor Forest Produce and others.**	190 0 0	85 0 0	73 0 0	760 0 0	870 0 0	250 6 0	292 12 0	356 6 0
7	Quarrying	204 4 0	..	..	..	..	..	..	..
8	Confiscated produce	6 9 0	18 15 0	3 14 0	2 0 0	..	..	..	..
9	Fines and forfeitures	9 0 0	735 12 3	52 6 9	..	14 4 0	..	11 0 0	..
10	House rent	81 5 0	77 6 0	199 12 0	127 0 0	234 8 0	248 4 0	454 8 0	300 8 0
11	Sale of ivory	..	165 7 0	..	..	..	..	..	..
12	Sale of bamboos	..	..	..	..	..	..	300 0 0	..
13	Other sources	123 13 0	794 13 8	2,310 4 6	101 0 0	180 0 0	503 8 0	400 7 2	302 15 3
	Add outstandings recovered ..	..	181 8 0	306 8 0	..	..	335 2 0	..	..
	Total ..	**4,220 8 0**	**22,878 14 11**	**12,864 14 1**	**21,463 12 2**	**19,516 8 9**	**24,417 15 0**	**3,767 5 8**	**3,434 15 3**
	Deduct oustandings	..	306 8 0	..	..	..	456 6 6	..	222 11 6
	Total as per register	**4,220 8 0**	**22,572 6 11**	**12,864 14 1**	**21,463 12 2**	**19,516 8 9**	**23,961 8 6**	**3,767 5 8**	**3,212 3 9**

Statement showing the expenditure incurred in Punachi Working Circle under Coode's Working Plan.

Serial number	Particulars of items.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1	Felling of timber	1,916 0 0	2,506 0 0	1,777 8 0	146 9 0	1,642 15 0	2,131 15 0	..	172 10 0
2	Conversion of spokes and felloes; sawing and carting of timber.	5,253 3 3	8,995 9 0	4,610 6 0	6,690 12 0	5,743 6 0	6,231 10 0	562 14 0	10 0 0
3	Felling Brake poles	115 12 0	54 0 0	68 12 0	21 14 0	50 0 0	123 14 0	62 8 0	200 0 0
4	Tending operations	523 10 0	399 12 0	317 2 0	353 6 0	461 12 0	307 10 0	368 0 0	288 9 0
5	Fire protection and burning the areas.	626 2 0	169 12 0	212 10 0	391 8 0	506 6 0	513 2 0	278 11 0	298 13 0
6	Construction and repairs of roads and dragpaths.	873 1 0	504 12 0	407 0 0	586 12 0	592 4 0	499 7 0	697 13 0	557 1 0
7	Demarcation and repairs to Cairns.	15 0 0	50 0 0	131 8 0	36 14 0	50 0 0	45 2 0	86 6 0	230 9 0
8	Cultural operations	45 12 0	123 0 0	126 4 0	30 14 0	245 7 0	195 13 0	505 11 0	441 8 0
9	Construction and repairs of buildings and sheds.	271 10 0	111 14 0	220 6 0	785 11 6	1,012 3 0	566 12 0	928 14 0	765 8 6
10	Replacement of stores, repairs to elephant gear and horness.	100 2 0	436 9 0	261 1 3	..	299 12 0	360 7 0	11 1 0	..
11	Feed and keep of livestock	1,880 13 0	7,950 7 6	6,188 0 0	3,619 4 6	5,931 15 0	3,529 13 3	28 4 0	..
12	Cost of Establishment, Travelling Allowance, etc. 2/3 of the whole cost.	3,612 0 0	4,923 9 4	4,971 13 4	4,297 4 8	4,106 12 0	4,509 0 0	3,147 14 0	3,788 8 0
13	Antimalarial measures and other items.	..	..	..	..	25 0 0	36 4 2	67 14 8	154 7 2
	Total as per register	**15,233 1 3**	**26,225 4 10**	**19,292 6 7**	**16,960 13 8**	**20,667 12 0**	**19,050 13 5**	**6,745 14 8**	**6,907 9 8**

Statement showing the profit and loss in Punachi Working Circle under Cood e 's Working Plan.

Serial number.	Particulars.	1926–27.	1927–28.	1928–29.	1929–30.	1930–31.	1931–32.	1932–33.	1933–34.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		RS. A. P	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1	Revenue	4,220 8 0	22,572 6 11	12,864 14 1	21,463 12 2	19,516 8 9	23,961 8 6	3,767 5 8	3,212 3 9
2	Expenditure	15,233 1 3	26,225 4 10	19,292 6 7	16,960 13 8	20,667 12 0	19,050 13 5	6,745 14 8	6,907 9 8
3	Profit	..	..	..	4,502 14 6	..	4,910 11 1	..	..
4	Loss	11,012 9 3	3,652 13 11	6,427 8 6	..	1,151 3 3	..	2,978 9 0	3,695 5 11

151. The statements show that in spite of the increased extraction of timber from the forests, and the consequent deterioration of the forests, the results of working have been a loss. Clearly therefore a period of freedom from over exploitation coupled with cheap methods of artificial regeneration are indicated for the future.

C. Fuel forests.

152. In 1889, Porter drew up a working plan for about 2,400 acres of forest south of Sethumadai, to be worked on a rotation of 12 years for fuel. It was subsequently revised by Bryant, but neither working plan was sanctioned. Maps however were prepared, lines were cut and fire traced and cattle excluded. From 1890 fuel was felled in localised areas, according as the market needed it, for a period of about five years: the fuel demand every year was known from this felling and it served as an index for fixing the size of the coupe in the locality.

153. The earliest sanctioned working plan for the tract was prepared by Gass in 1896 for the Ayerangal Fuel Working Circle of 800 acres, to be worked on the coppice with standards system on a rotation of twenty years. Not less than 25 standards per acre were to be retained, and the coupe was to be worked departmentally. No sowing or planting were to be done after the fellings, but cleanings of creepers and weeds were prescribed for two years. This working plan worked for the whole rotation.

154. In 1902, Foulkes prepared a working plan for the rest of the outer slopes of the Anamalais included in Pollachi range, treating the above working plan as a part of his working plan. It constituted newly the Kottur Fuel Working Circle, an area of 2,800 acres, to be worked on the coppice with standards system on a rotation of twenty years. Up to 40 standards per acre were to be retained if that number could be found. No clearing or weeding was prescribed except the removal of *Cochlospermum gossypium* and *Balsamodendron Berryi*. Sowings and plantings of palmyra along the external boundaries of coupes was to be done free of cost by the subordinates. This working plan was worked till revised later. The working plan constituted also a Timber Working Circle, a Western Closed Working Circle, and an Eastern Closed Working Circle—all to be protected.

155. In 1902 another working plan for the Amaravati valley forests of Udamalpet range was also prepared by Foulkes, constituting the following Fuel Working Circles :—

	ACRES.
The Amaravati Valley Working Circle	5,168
The Kamanuthu Valley Working Circle	6,092
The Dhali Working Circle	3,203

Here too, the coppice with standards system was adopted, rotation being fixed at fifteen years. The standards were to be introduced as there were no suitable ones in the forest. No cleanings or thinnings were prescribed. Sowings of species suited for manure leaves, and planting of timber species to serve as standards were prescribed. Palmyra seeds were to be sown free of cost by the subordinates.

156. In Udamalpet range the working plan of 1902 had prescribed felling, on the coppice with standards system, of annual coupes of 150 to 720 acres in the three fuel felling series, and it was found that due to difficulty in procuring labour and due to coupes being too high up the hill sides the fellings were very much in arrears. Accordingly in 1919, the working plan was revised by Habibullah Sahib reconstituting the three fuel felling series—Amaravati, Kamanuthu and Dhali—over an area of 7,549 acres. The treatment prescribed was simple coppice on a thirty-five year rotation. In the year following the fellings, cleaning was prescribed for such coupes as required the operation. Prickly-pear removal was also prescribed; but latterly prickly-pear died out. In each felling series, 6 bags of seeds of fuel species were to be broad-cast free of cost. The whole area was closed to grazing. Though this working plan was not sanctioned as such, a summary of its prescriptions was approved. and the coupes now under working are according to this scheme.

157. In course of time, the market needed more fuel, and Gudaravalli and Pachathanni fuel series were commenced to be worked in the " Western Closed Working Circle " from

1907 and 1911, respectively. This informal working continued till 1920 when a "summary of prescriptions" was made by Mr. Crothers for the working of the following fuel series, which were reconstituted to be worked from 1921–22 :—

(a) Pothamadai fuel felling series.
(b) Gudaravalli fuel felling series.
(c) Ayerangal fuel felling series.
(d) Pachathanni fuel felling series.
(e) Kottur fuel felling series.

The system of working was also changed to simple coppice as the timber requirements could be adequately met with from the adjacent Mount Stuart forests.

158. In 1923, Dyson drew up a working plan to regularise the working in Pollachi range and it was sanctioned. The system continued to be simple coppice on a thirty-year rotation. It was prescribed by him that during the year subsequent to felling a weeding was to be carried out in each coupe, and the coppice freed by cutting all climbers and useless growth interfering with its development. All lantana was to be pulled out during the operation. Though much more elaborate weeding and uprootal of lantana was desirable, it could not be justified financially. In 1932, as a deviation to the above working plan, two further fuel felling series, Keerapadi and Nallar, were added to the Fuel Working Circle, making its area up to 7,013 acres. All tending operations were deleted. This working plan is still in operation for Pollachi range.

D. Bamboos.

159. The earliest reference in working plans to extraction of bamboos is in the 1896 working plan for the Ayerangal block : "Such bamboos as are found in the block will be cut and sold departmentally."

160. According to Foulke's working plan of 1902, bamboos were marketable only to a very small extent, and no reference is made to the future extraction of bamboos.

161. Dyson's working plan of 1923 for Pollachi range states that "bamboos have been worked on a five-year rotation in three bamboo felling series. Coupes are sold annually to contractors in auction." It constituted the whole of Pollachi range into a bamboo working circle divided into the following six felling series each with three coupes to be worked on a three-year rotation :—

(1) Pothamadai bamboo felling series.
(2) The Ayerangal "Upper" bamboo felling series.
(3) The Ayerangal "Lower" bamboo felling series.
(4) The Pachathanni bamboo felling series.
(5) The Villoni bamboo felling series.
(6) The Thadaganachi bamboo felling series.

162. Since 1916, attempts have been made to sell the bamboos of Udamalpet range on a three-year rotation with partial success.

E. Minor forest products.

163. The minor forest products which are usually collected are listed in paragraph . The growth of the tanning industry in India has been considerable since the Great War, and the collection of tanning barks and fruits, as minor forest products, greatly increased in the years immediately following it.

164. In 1868, an overseer of forests was appointed to supervise the departmental collection of minor forest products. In 1879, a Government Order allowed the Pulayars of Punachi, the Kaders and the indigent hill men of the Anamalais the right to collect and enjoy the minor forest products, but this was not to interfere with the right of the Government to collect the same. All sale of minor forest products could only be made to Government or their agents. This right was also conceded at the settlement of the reserves in 1883.

165. The departmental collection of minor forest products was continued till about 1905, but in 1905–06, the Anamalais Planters Associations bought the right to collect the products from Punachi range, since it gave them control over the local labour and also over the collection of produce in their own assignments. The arrangement continued and in 1913–14, the lease was given to them for Rs. 330 a year for the whole area of the present Punachi and Ulandi ranges, and also for a portion of Pollachi range. In 1922–23, the portion of Pollachi range was excluded and the amount was reduced to Rs. 280 a year, an arrangement which was continued contrary to the interests of the Government. The audit department raised an objection to this procedure as a result of which the area leased to planters was restricted to a range of two miles from the limits of the plantations, for which the lease amount continued to be the same. The area excluded was sold in auction and it fetched Rs. 300 and Rs. 700 in 1928 and 1929. As the planters again requested the produce to be sold to them, the right to collect cardamoms alone from Punachi and Ulandi ranges was given to them in

1930 for Rs. 750 and the right to collect other minor forest products only within a range of two miles from their estate limits also for Rs. 50. The right to collect other minor forest products elsewhere in the excluded area was sold in auction for Rs. 310. In 1931–32, to avoid friction, the whole minor produce from Punachi range was allowed to be collected by the Association for Rs. 1,000. In 1932–33 the planters did not wish to buy the produce and a contractor purchased it for Rs. 1,021. In 1933–34 the Collector's intercession was sought and the Planters' Association obtained the right to collect the produce from the Punachi and Ulandi ranges for Rs. 1,200. The Association also requested that the lease be continued to them for a period of ten years on the same terms, and it has been approved by the Chief Conservator.

166. Elsewhere in the area the right to collect the produce has since 1907–08, been sold in auction,—an arrangement which has resulted in smooth working, and in a steadily increasing source of revenue to the department.

F. Grazing.

167. Till 1888, grazing was free. In that year grazing permits were introduced, the rates being annas 8 and annas 2, for buffaloes, bulls or cows and sheep, respectively. Goats were excluded. In 1898, the rates were altered to annas 6, annas 3, and annas 1½. There have been several changes since then: the present rates are Re. 1, annas 8 and annas 4, respectively. The fee for asses or horses is the same as for cows or bulls, while for elephants a charge of Re. 1 per day is levied on special permission to be obtained.

168. Penning is allowed in approved pens. Till 1921, a fee of one rupee was charged to each permit-holder to pen his cattle at a recognized pen. In 1922 the penning fee was abolished.

169. Mostly local cattle seek grazing in the Division.

170. In Pollachi range, Mr. Porter's original draft of the 1889 working plan contained a prescription for total exclusion of cattle from working plan areas, and a similar prescription was included in Gass's working plan of 1896. Foulkes working plan of 1902 closed only felled coupes to grazing for a period of five years after felling.

171. Dyson's working plan of 1923, prescribed that as some of the outer slopes of the reserves, till then closed to grazing, had received no beneficial effect from the prescription and that it had indeed acted detrimentally in encouraging the spread of prickly-pear, the forests should remain open to grazing with the exception of fuel coupes which would be closed for five years after felling. No limit to the number of cattle admitted was considered necessary.

172. In Udamalpet range, the forests of which are similar to those in Pollachi range, elaborate restrictions on the number of cattle admitted for grazing were imposed, from time to time, under various grazing schemes constituting grazing blocks, and extensive areas were closed to grazing. These schemes are now obsolete consequent on G.O. No. 595, Development, dated 29th April 1932, declaring that cattle may be grazed on a single permit anywhere in a division.

G. Elephant-capturing operations.

173. For some years elephant-capturing operations were attempted in Pollachi range. As the operations formed part of the administration of Tunacadavu range for which a separate working plan exists, they are not referred to here.

H. Fire-protection.

174. In 1888–89, fire-protection in the division was initiated and Dhali reserve and part of Anamalai reserve south of Sethumadai were first fire-protected. The system was extended later to all the outer slopes. In 1902 the area fire-protected was about 10,000 acres; eleven fire patrols were to be engaged to ensure satisfactory protection, according to the working plan for Pollachi range. The coupes of Udamalpet range were also fire-protected by fire lines and employment of fire-watchers during the hot season.

175. The working plan for Udamalpet range fuel coupes prepared in 1919 prescribed that coupes should be fire-protected for ten years after felling by engaging four fire-watchers for four months from the 15th February. Boundaries of enclosures and temples, and 10½ miles of rights of way were to be fire-traced.

176. The working plan for Pollachi range prepared by Mr. Dyson in 1923 states that "Fires do little damage. No protective work is prescribed."

177. In the Punachi Working Circle fire-protection is still carried out by the maintenance of fire lines.

178. The following statement gives the expenditure on fire-protection in the last fourteen years :—

Statement of expenditure on fire-protection in the area covered by the working plan.

Serial number. (1)	Year. (2)	Punachi range. (3)	Pollachi range. (4)	Udamalpet range. (5)	Total. (6)	Remarks. (7)
		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	
1	1920–21	256 3 8	185 8 0	129 0 0	570 11 8	From July to March—9 months only.
2	1921–22	310 0 0	417 6 6	346 15 0	1,074 5 6	
3	1922–23	95 4 0	177 5 0	97 11 6	370 4 6	
4	1923–24	120 13 0	..	..	120 13 0	
5	1924–25	128 3 0	..	..	128 3 0	
6	1925–26	145 7 0	18 0 0	..	163 7 0	
7	1926–27	361 0 0	132 12 0	..	493 12 0	
8	1927–28	162 12 0	54 0 0	..	216 12 0	
9	1928–29	287 10 0	32 8 0	..	320 2 0	
10	1929–30	315 12 0	42 4 0	..	358 0 0	
11	1930–31	357 8 0	..	..	357 8 0	
12	1931–32	324 4 0	..	..	324 4 0	
13	1932–33	334 4 0	11 13 0	..	346 1 0	
14	1933–34	361 14 6	..	..	361 14 6	

Note.—Though no definite fire-protection was prescribed in Pollachi Working Plans, the above expenditure has been made as rewards for *putting out fires.*

SECTION 3.—SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN.

179. The following statements give details of the forest roads, paths and buildings which have been constructed in the past and which are maintained by the department :—

Particulars of roads, cart tracks and bridle paths existing in Pollachi, Punachi and Udamalpet ranges of South Coimbatore Division.

Serial number. (1)	Description. (2)	Year of construction. (3)	Length. (4)	Cost of construction. (5)	Remarks. (6)
			M. F. CH. FT.	RS. A. P.	
1	Cinchona Lower road	1927–30	4 0 0 377	22,773 14 0	
2	Sirukundra-Cinchona road	1930–31	1 3 2 33	Not known.	
3	Ali-Ar cart track (Punachi)	1920–23	6 5 0 0	7,082 4 10	
4	Suspension bridge across Kal-Ar ..	1930–31	..	947 6 0	
5	Bridle path leading to Kal-Ar suspension bridge.	1930–31	0 4 0 0	Not known.	
6	Villoni bridge path (Punachi-Pollachi ranges).	Not known.	12 0 0 0	Do.	
7	Nal-Ar cart track	1930–31	0 0 20 0	50 0 0	
8	Anamalai Farm compound road ..	Not known.	0 1 5 0	Not known.	
9	Sethumadai compound road	Do.	0 1 0 0	Do.	
10	Pachathanni cart track	1909–11	1 3 0 0	142 7 5	
11	Adivaram road (Sethumadai old road).	Not known.	0 6 0 0	Not known.	
12	Pothamadai cart track	1926–27	2 0 2 28	2,154 9 0	
13	Ali-Ar valley road (Navamulai) ..	1913–14	1 4 0 0	1,499 7 0	
14	Oralapillu cart track (Pollachi) ..	Not known.	1 4 0 0	Not known.	
15	Gudaravalli-Keerapadi cart track ..	Do.	4 0 0 0	Do.	Total cost being Rs. 3,27,987-7-5.
16	Sethumadai-top slip road from 9th mile to 14th mile.	1927–28	5 0 0 0	..	
17	Elayamuthur-Manthorai road ..	1896–97 and 1914	9 2 0 0	3,292 4 0	
18	Kombu road	1912–13	1 2 0 0	240 0 0	
19	A country cart track from 1st mile 5th furlong on the Elayamuthur-Manthorai road rounding the old coupes to Manthorai rest-house.	Not known.	About 2 miles.	This was not constructed by the department nor maintained.	
20	Country cart track from 17th mile 3rd furlong on the Chinnar public road to Sarakkupatti car stand for transport of bamboos.	Do.	About 6 furlongs.	Do.	
21	Country cart track from 17th mile 7th furlong on the Chinnar public road to Kattalaparaiammankoil near Kodanthur.	Do.	About 2 miles.	Do.	

N.B.—Item No. 6 was constructed and maintained by the Public Works Department. No record is variable of item Nos. 5, 14 and 15

Statement of buildings, wells and depot sites in the working plan area.

Serial number. (1)	Name of building, site or well. (2)	Date of erection or purchase. (3)	Recorded capital value. (4) RS.	A.	P.	Remarks. (5)
	PUNACHI RANGE.					
1	Range Officers quarters at waterfall	1929–30	4,498	0	0	R
2	Range office and clerk's quarters at waterfall	1930	2,424	0	0	R
3	Forester's and peon's quarters at waterfall	1930	2,424	0	0	R
4	Ranger officer's quarters including Range Officer's Office, clerk's office, kitchen and latrine at Valparai (Cinchona)	1928	1,112	12	0	R
5	Forester's quarters at Cinchona	1928	726	0	0	R
6	Post office building at Attikatti (constructed 1918) acquired	1932	3,687	0	0	R
7	Line Man's quarters at Attikatti	1932	614	0	0	R
8	Grain store at Attikatti	1909–10	503	0	0	
9	Store and shed at Valparai (Cinchona)	1928	151	0	0	
	UDAMALPET RANGE.					
1	Range officer's quarters and range office at Udamalpet and outhouse	1892	2,800	0	0	R
2	Depot keeper's quarters at Udamalpet	1907–08	812	0	0	R
3	Depot watchers quarters at Udamalpet	1907–08	452	0	0	R
4	Depot keeper's and depot watcher's quarters compound 2 acres 26 cents acquired	1907	500	0	0	
5	Tana shed at Udamalpet at Dhali road	1913	342	0	0	R
6	Servants' quarters at Esalamthorai	1893–94	534	0	0	R
7	Subordinate's line at Esalamthorai	1921	3,231	0	0	R
8	Do. Thalingi	1913	916	0	0	R
9	Do. Koratoor	1930–31	2,248	0	0	R
10	Do. Mampatti	1931	2,288	0	0	R
11	Rest-house at Esalamthorai (1 dining hall, 2 bed rooms, 2 bath rooms, verandah and out-house)	1890–91	1,323	0	0	
12	Stable attached to rest-house at Esalamthorai	1894–95	115	0	0	
13	Inspection shed at Kombu (2 rooms, 2 bath rooms, 1 portico, and 1 verandah)	1895–96	2,150	0	0	
14	Servants' line of 2 rooms and 2 stables attached to rest-house at Kombu	1902–03	478	0	0	
15	Inspection shed and addition at Kallapuram	1895–96	897	0	0	
16	Rest-house with servants' line and stable (2 bed rooms, 2 bath rooms, verandahs on all sides, out-house and stable at Manthorai)	1911–12	2,531	0	0	
17	Kitchen attached to the rest-house	1914	247	0	0	
18	Well inside the Esalamthorai compound at the back of the rest-house (23½ feet deep)	Not known.	89	0	0	
19	Well inside the range office compound in Udamalpet (36 feet deep)	1892	29	0	0	
20	Well in the Depot compound at Udamalpet (40 feet deep)	1907	500	0	0	
	POLLACHI RANGE.					
1	Range Officer's quarters at Anamalai village with out-house and stable	Before 1901–02	4,310	0	0	R
2	Office room at Anamalai village	1901–02	2,050	0	0	
3	Range Officer's quarters at Anamalai Farm	1921	3,412	0	0	R
4	Range clerk's quarters at Anamalai Farm	1921	2,544	0	0	R
5	Combined office and clerk's quarters at Anamalai Farm	1920	2,647	0	0	R
6	Lines' Man's quarters at Anamalai Farm	1921	1,485	0	0	R
7	Sub-lines (5 rooms) at Anamalai Farm	1921	2,595	0	0	R
8	Engine house and gin-house at Anamalai Farm	1921	5,260	0	0	
9	Garden well at Anamalai Farm	1921	1,790	0	0	
10	Anamalai Farm compound 8 acres 35 cents acquired.	1–12–33	1,670	0	0	
11	Anamalai village compound 1 acre 99 cents acquired.	Before 1901–02	850	0	0	
12	Sethumadai Overseer's and sub-overseer's quarters compound 5 acres 38 cents acquired	1920	1,023	10	0	
13	Overseer's quarters at Sethumadai	1920	3,220	0	0	R
14	Sub-overseer's quarters at Sethumadai	1920	2,330	0	0	R Items 1, 2, 8, 13, 14, and 23 are proposed for auction in Chief Conservator's Reference No. 6838/33 A-2, dated 11th December 1933, as they are vacant.
15	Clerk's quarters at Sethumadai (2 rooms)	1901	236	0	0	R
16	Forester's quarters at Sethumadai	1901	525	0	0	R
17	Pollachi range officer's quarters at Sethumadai	1902	793	0	0	R
18	Pollachi subordinate's quarters at Sethumadai	1893–94	592	0	0	R
19	Tunacadavu range officer's quarters at Sethumadai.	1891–92	1,107	0	0	R
20	Tunacadavu subordinate's quarters at Sethumadai.	1915	1,229	0	0	R
21	Tana shed at Kottur (occupied by guard)	1913	580	0	0	R
22	Subordinates' line at Tulukamadai (3 rooms)	1913	2,767	0	0	R
23	Store room at Anamalai village	1909–10	1,689	0	0	
24	Rest-house (dining hall, bedroom, store room, 2 verandahs, stable and garrage at Anamalai Farm)	1923	4,046	0	0	
25	Kitchen attached to the rest-house Do. at Anamalai Farm	1923	1,170	0	0	
26	Motor shed attached to Do. do.	1923	531	0	0	
27	Rest-house at Sethumadai with kitchen and stable (1 dining hall, 2 bed rooms, 2 bath rooms, verandah, out-house stable)	1885–86	2,304	0	0	

Statement of buildings, wells and depot sites in the working plan area—cont.

Serial number. (1)	Name of building, site or well. (2)	Date of erection or purchase. (3)	Recorded capital value. (4) RS. A. P.	Remarks. (5)
	POLLACHI RANGE—*cont.*			
28	Irrigation channel and aqueduct at Anamalai Farm	1923	510 0 0	
29	Tana shed at Tulukamadai	1920–21	394 0 0	
30	Kraal at Ayerangal (Adivaram)	Do.	836 0 0	Transferred from Tunacadavu range.
31	Well at Sethumadai compound (71 feet deep) ..	Not known.	300 0 0	
32	Well very near to Sub-Overseer's quarters at Sethumadai (24 feet deep).	1920	960 0 0	
33	Well at Anamalai Farm situated between the rest-house and range officer's quarters (13 feet deep).	1927	245 0 0	
34	Well at Tulukamadai for the use of subordinates (24 feet deep).	1921–22	249 0 0	

Note.—(1) The standard rent on residential buildings calculated in accordance with Fundamental Rule 45-A amounts to Rs. 3,077 per year. In practice, it has been found that in the last two years the actual rent realised is only about 34 per cent of this sum, approximately Rs. 1,037 a year.

(2) The rent realised from non-residential buildings such as rest-houses amounts usually to about Rs. 90 a year.

(3) 'R' denotes residential buildings.

SECTION 4.—PAST YIELD.

180. The yield of timber and other forest produce obtained from the area in recent years is given in the following statements. The produce has been obtained both by departmental extraction and through the agency of contractors :—

Consolidated statement showing the yield of timber, fuel and bamboos from 1920–21 *to* 1932–33.

Serial number.	Year.	Timber in cubic feet. Teak.	Rosewood.	Vengai.	Mesua.	Red cedar.	Miscellaneous spp.	Piece product. Spokes and felloes.	Brake poles in numbers.	Firewood. T. Q.	Charcoal. T. Q.	Bamboos. T. Q.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1	1920–21	11,851	1,831	3,480	..	..	446 logs and 1,484 c.f.t.	..	1,496	4,169 54	55 0	343 72
2	1921–22	12,358	3,999	1,845	..	..	7,178 c.ft.	276 spokes. 172 felloes.	1,130	4,917 22	22 70	667 36
3	1922–23	12,927	6,684	5,411	..	..	23 logs and 2,370 c.ft.	125 sets.	1,430	2,062 18	..	901 54
4	1923–24	8,029	2,005	3,682	..	..	1,881 c.ft.	19 ,,	1,778	1,367 20	..	558 76
5	1924–25	5,006	2,678	2,850	..	..	457 ,,	25 ,,	740	1,485 48	..	453 00
6	1925–26	4,101	317	7,223	..	..	316 ,,	..	548	1,604 32	..	542 54
7	1926–27	6,143	3,927	1,710	21,700	..	881 ,,	50 ,,	1,803	3,488 48	..	1,710 46
8	1927–28	13,628	2,565	8,659	41,931	..	3,875 ,,	69 ,,	984	3,751 34	..	831 42
9	1928–29	11,646	5,551	5,118	41,336	..	6,760 ,,	45 ,,	1,138	3,659 60	..	1,084 20
10	1929–30	546	498	1,301	60,217	2,205	4,859 ,,	13 ,,	396	6,127 70	114 0	918 66
11	1930–31	12,313	4,642	3,874	44,951	2,184	695 ,,	68 ,,	800	4,753 74	..	1,139 32
12	1931–32	19,764	6,490	5,285	44,879	2,139	228 ,,	42 ,,	2,767	3,451 18	3 18	687 24
13	1932–33	Nil.	Nil.	113	45,470	..	12,136 ,,	..	2,000	8,910 53	..	1,860 27

Note.—The following conversion factors have been adopted :—

2 Headloads (4 qrs.) — 1 Assload.
20 ,, — cartload 40 Qrs. : 28 lbs.—1 Quarter.
80 Quarters — 1 Ton. (Bambusa arundinacea).

1 Stack of fuel : 1 Ton—5′ × 3′ × 4′ — 60 c.ft.
1 set of spokes and felloes : 24 spokes and 12 felloes.
1 Ton of bamboos—2 cart loads—200 bamboos.

Consolidated statement showing the yield of minor forest produce from 1920–21 *to* 1932–33.

Serial number.	Year.	Seekai.	Thattankottai.	Poochakottai.	Mangoes.	Sundakkai and Nellikkai.	Kilakkai.	Vilankai.	Tamarind.	Plantain leaves.	Karuveppilla.	Korai grass.	Manjee.	Eacham grass.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q	T. Q.	T. Q.	T. Q.
1	1928–29	..	..	..	2 40	0 26	0 20	0 12	4 28	6 0	0 4	0 70	0 14	47 40
2	1929–30	1 58	..	0 42	4 60	0 56	2 40	..	11 40	0 56	..	0 52	..	178 48
3	1930–31	..	..	3 26	0 30	1 27	0 60	0 6	27 18	0 39	..	0 5	..	74 39
4	1931–32	..	..	1 54	24 50	4 45	5 20	0 8	69 7	5 32	..	2 27	0 6	55 8
5	1932–33	0 51	..	1 63	3 24	1 14	2 57	..	123 74	..	..	0 11	..	47 77

Consolidated statement showing the yield of minor forest produce from 1920–21 to 1932–33—cont.

Serial number.	Year.	Ginger.	Mahali root.	Vembatam bark.	Canes.	Dammer.	Peppudal.	Honey.	Wax.	Gall nut.	Avaram bark and Konnai bark.	Naval grass.	Korai kodi.	Cardamom.	Shambur horns.
		(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
		T.Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.	T. Q.
1	1928–29	..	4 4	..	6 68	0 8	..	0 25	0 6	2 45	..	..	..	..	..
2	1929–30	..	1 4	0 74	19 30	1 48	..	1 9	0 19	8 75	35 50	8 35	0 34	11 30	0 20
3	1930–31	..	1 75	..	23 31	3 8	5 2	0 65	0 13	10 13	32 49	4 60	9 67	0 6	0 10
4	1931–32	..	5 61	..	21 43	1 17	4 2	1 27	0 8	20 19	9 43	7 60	0 2	0 4	0 55
5	1932–33	..	0 56	..	31 4	1 18	0 16	0 15	..	4 50	2 5	5 35	1 30	0 32	0 8

Note.—(1) The complete yield for years earlier than 1928–29 are not available. (2) The following conversion factors have been adopted :—

20 Head loads : 1 cart load : 40 Quarters : ½ Ton. | 4 Quarters : 1 Bag.
28 Lbs. : 1 Quarter. | 10 Bags : 1 Pothi.
80 Quarters. : 1 Ton.

Consolidated statement showing the products removed on permits from 1923–24 to 1932–33.

Serial number.	Year.	Agricultural implements in number.	Firewood.	Shed materials in number.	Odai leaves.	Chistled stone.	Rough stone.	Earth.	Gravel.	Metal.	Brake poles in numbers.	Reeds.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
			CL. HDL.		HDL.	C.L.	C.L.	C.L.	C.L.	C.L.		HDL.
1	1923–24	381	1 12	..	..	..	..	..	..	7,992		
2	1924–25	..	11 4	2	148	..	2,712	25	..		..	..
3	1925–26	373	6 0	..	..	25	779	240	..	..	..	..
4	1926–27	229	21 0	3	..	50	5,341	..	..	..	12	..
5	1927–28	248	27 0	2	..	..	2,337	..	700	..		..
6	1928–29	..	80 4	..	14	10	1,369	780	300	..	..	..
7	1929–30	566	22 6	..	..	240	695	..	5,888	200	..	400
8	1930–31	708	14 0	..	16	16	100	1,626	2,495	900	..	300
9	1931–32	588	7 0	..	24	24	1,042	610	3,725	1,150	82	..
10	1932–33	500	37 0	..	..	..	2,581	770	..	6,945	..	40

CL.—Cartload. HDL.—Headload.

SECTION 5.—PAST REVENUE AND EXPENDITURE.

181. The following statements show the net revenue from the various items of forest produce collected and sold from the working plan area :—

Consolidated statement showing the gross revenue, expenditure and net revenue on timber, bamboos, firewood and charcoal and minor forest produce from 1920–21 to 1932–1933.

Serial number.	Particulars of items.	Year.	Timber. Amount in rupees.	Bamboos. Amount in rupees.	Firewood and charcoal. Amount in rupees.	Minor Forest produce. Amount in rupees.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Revenue by—					
	Government Agency	1920–21 ..	24,533	..	..	..
	Private Agency		3,392	4,288	9,178	7,406
	Expenditure		20,955	..	..	..
	Net revenue		6,970	4,288	9,178	7,406
2	Revenue by—					
	Government Agency	1921–22 ..	77,387	..	..	..
	Private Agency		7,851	7,171	14,933	6,738
	Expenditure		64,962	..	..	..
	Net revenue		20,276	7,171	14,933	6,738
3	Revenue by—					
	Government Agency	1922–23 ..	22,433	..	..	..
	Private Agency		13,088	5,451	14,513	8,579
	Expenditure		6,287	..	..	..
	Net revenue		29,234	5,451	14,513	8,579
4	Revenue by—					
	Government Agency	1923–24 ..	17,097	..	..	..
	Private Agency		16,535	6,301	15,670	11,899
	Expenditure		7,033	..	..	..
	Net revenue		26,599	6,301	15,670	11,899
4	Revenue by—					
	Government Agency	1924–25 ..	1,765	..	1	..
	Private Agency		11,433	4,535	11,131	6,869
	Expenditure		9,478	..	..	..
	Net revenue		3,720	4,535	11,132	6,869
5	Revenue by—					
	Government Agency ..	1925–26 ..	..	..	..	..
	Private Agency		..	..	..	..
	Expenditure		..	..	..	..
	Net Revenue		..	..	..	..

Consolidated statement showing the gross revenue, expenditure and net revenue on timber, bamboos, firewood and charcoal and minor forest produce from 1920–21 to 1932–33—cont.

Serial number.	Particulars of items.	Year.	Timber. Amount in rupees.	Bamboos. Amount in rupees.	Firewood and charcoal. Amount in rupees.	Minor Forest produce. Amount in rupees.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
7	Revenue by—					
	Government Agency	1926–27 ..	3,288	..	5	109
	Private Agency	1926–27 ..	30	5,955	10,312	6,055
	Expenditure	1926–27 ..	9,243	..	..	52
	Net revenue	1926–27 ..	−5,925	5,955	10,317	6,112
8	Revenue by—					
	Government Agency	1927–28 ..	18,218	..	2,322	487
	Private Agency	1927–28 ..	2,412	4,707	11,467	5,637
	Expenditure	1927–28 ..	13,383	107	1,438	..
	Net revenue	1927–28 ..	7,247	4,600	12,351	6,124
9	Revenue by—					
	Government Agency	1928–29 ..	9,117	16	5,548	192
	Private Agency	1928–29 ..	1,596	5,823	11,373	7,589
	Expenditure	1928–29 ..	7,376	..	1,845	..
	Net revenue	1928–29 ..	3,337	5,839	15,076	7,781
10	Revenue by—					
	Government Agency	1929–30 ..	5,316	..	299	155
	Private Agency	1929–30 ..	1,384	5,333	18,849	7,787
	Expenditure	1929–30 ..	9,637	..	280	..
	Net revenue	1929–30 ..	−2,937	5,333	18,868	7,942
11	Revenue by—					
	Government Agency	1930–31 ..	1,83,340	..	121	219
	Private Agency	1930–31 ..	724	7,995	15,716	6,203
	Expenditure	1930–31 ..	90,692	..	164	64
	Net revenue	1930–31 ..	93,372	7,995	15,673	6,358
12	Revenue by—					
	Government Agency	1931–32 ..	1,20,460	..	55	1
	Private Agency	1931–32 ..	586	5,249	13,361	4,537
	Expenditure	1931–32 ..	71,729	..	..	..
	Net revenue	1931–32 ..	49,317	5,249	13,416	4,538
13	Revenue by—					
	Government Agency	1932–33 ..	1,21,839	..	30	465
	Private Agency	1932–33 ..	1,282	2,944	13,886	6,038
	Expenditure	1932–33 ..	69,233	..	..	40
	Net revenue	1932–33 ..	53,888	2,944	13,916	6,463

REMARKS.—Records not available for 1925–26.

SECTION 6.—FINANCIAL RESULTS OF PAST WORKING.

182. The following statements give the financial results of the working of the forests in the recent past :—

Consolidated statement showing the revenue realized between the years 1920–21 and 1932–33.

Serial number.	Year.	Timber and other produce removed by Government agency. Timber.	Fuel.	Bamboos.	Other minor produce.	Timber and other produce removed by purchasers or consumers. Timber.	Firewood and charcoal.	Bamboos.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1	1920–21	24,533 2 5	..	..	..	3,392 3 1	9,178 0 2	4,287 9 3
2	1921–22	77,387 4 4	..	..	..	7,850 8 9	14,932 10 5	7,171 2 9
3	1922–23	22,432 12 2	..	..	..	13,087 12 2	14,512 14 4	5,451 0 0
4	1923–24	17,096 12 10	..	..	..	16,534 13 6	15,669 11 0	6,301 4 0
5	1924–25	1,765 2 0	1 0 0	..	..	11,433 2 1	11,130 9 6	4,135 4 0
6	1925–26	..	..	..	..	..	..	..
7	1926–27	3,288 3 0	5 6 0	..	109 5 0	29 8 0	10,311 8 0	5,954 12 0
8	1927–28	18,217 12 0	2,321 13 0	..	486 15 0	2,412 7 0	11,466 15 0	4,707 6 5
9	1928–29	9,116 10 6	5,547 10 9	15 15 0	191 10 9	1,596 2 0	11,372 15 4	5,823 7 0
10	1929–30	5,315 8 0	299 4 0	..	154 15 9	1,383 9 6	18,849 1 0	5,333 7 0
11	1930–31	1,83,339 10 6	120 8 0	..	219 6 4	724 6 0	15,715 14 0	7,995 0 0
12	1931–32	1,20,459 10 0	55 0 0	..	0 10 0	585 8 0	13,361 7 9	5,248 12 3
13	1932–33	1,21,838 9 0	29 12 0	..	465 7 6	1,282 5 0	13,885 11 3	2,943 8 0

Serial number.	Year.	Timber and other produce removed by purchasers or consumers. Grazing and fodder grass.	Other minor produce.	Confiscated produce.	Miscellaneous revenue. Fines and forfeitures.	Rents of buildings, revenue derived from Revenue department and other sources.	Total.
		(10)	(11)	(12)	(13)	(14)	(15)
		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
	1920–21	3,390 5 0	7,405 14 9	152 2 0	2,627 9 6	52,226 14 11	1,07,193 13 1
2	1921–22	4,265 5 0	6,739 0 7	109 0 6	5,354 7 7	73,011 15 7	1,96,821 7 6
3	1922–23	6,332 11 7	8,579 4 9	127 1 3	3,750 15 11	43,072 2 1	1,17,346 10 3
4	1923–24	5,866 7 0	11,898 13 0	137 6 6	3,259 8 6	47,539 6 2	1,24,304 2 6
5	1924–25	5,617 8 0	6,869 3 9	77 8 3	60 0 0	50,953 7 8	92,042 13 3
6	1925–26	....	....	....	....	....	....
7	1926–27	6,066 7 0	6,054 13 7	181 8 9	474 5 0	63,465 4 4	95,941 0 8
8	1927–28	5,619 3 6	5,637 4 0	128 12 0	511 12 0	11,597 11 7	63,107 15 6
9	1928–29	5,161 0 0	7,589 1 3	56 1 0	162 9 9	11,765 15 5	58,399 2 9
10	1929–30	4,829 12 0	7,787 0 0	30 8 6	157 8 0	7,639 14 9	51,780 8 6
11	1030–31	4,634 0 0	6,203 7 7	47 4 8	79 0 0	12,525 14 10	2,31,604 7 11
12	1931–32	4,279 8 0	4,536 10 6	26 2 3	805 0 0	9,888 15 6	1,59,247 4 3
13	1932–33	4,159 4 0	6,038 6 0	40 2 0	161 8 0	9,258 13 0	1,60,103 5 9

Note.—No figures are available for 1925–26. The revenue realised from sandalwood in Udamalpet range is not included in this. During the 13 years the revenue from sandal wood is only Rs 17–13–0 for 1927–28, 1929–30 and 1930–31.

Consolidated statement showing expenditure from 1920–21 *to* 1932–33.

Serial number.	Year.	Departmental extraction and collection.	Cutting coupe lines and expenditure on B-II timber.	Confiscated produce.	Purchase and feed and keep of cattle and stores.	Roads.	Buildings.	Other works.	Demarcation.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1	1920–21 ..	19,990 2 4	964 13 10	2 8 0	17,760 2 9	3,594 7 4	5,500 4 5	35 9 6	16 6 0
2	1921–22 ..	63,469 14 0	1,492 6 3	9 10 0	39,501 6 2	4,990 8 7	1,367 5 9	368 14 0	372 8 0
3	1922–23 ..	5,404 4 6	927 6 4	28 10 0	11,455 12 7	5,073 2 1	585 13 6	57 0 6	94 0 0
4	1923–24 ..	5,408 11 3	1,623 14 6	18 0 0	5,982 9 4	1,368 5 6	1,776 0 3	40 1 0	103 3 0
5	1924–25 ..	7,909 12 0	1,569 3 6	4 6 0	5,323 10 8	674 0 9	1,444 10 6	82 4 6	118 0 0
6	1925–26 ..	..	..	..	..	..	..	..	..
7	1926–27 ..	7,648 12 3	1,646 11 0	..	7,339 5 0	2,357 4 0	1,337 15 9	273 14 0	177 0 0
8	1927–28 ..	13,149 10 6	1,777 6 0	1 8 0	11,970 15 0	1,051 4 6	5,422 6 0	43 4 0	50 0 0
9	1928–29 ..	8,310 9 0	2,665 5 6	..	6,451 14 6	872 8 0	6,185 10 6	38 0 0	57 0 0
10	1929–30 ..	7,181 15 0	2,776 13 0	..	6,723 7 0	1,136 4 6	3,268 7 6	19 15 6	201 8 0
11	1930–31 ..	87,991 0 6	2,929 2 0	..	6,577 12 0	4,717 12 0	4,996 13 4	78 4 0	218 14 0
12	1931–32 ..	69,043 6 0	2,685 6 0	..	4,538 1 9	4,959 0 0	2,541 15 6	110 7 0	114 0 0
13	1932–33 ..	66,749 3 6	2,523 9 6	..	134 15 11	2,583 4 0	2,763 14 9	60 7 0	666 13 0

Serial number.	Year.	Cultural operation.	Fire protection.	Other works under organisation improvement and extension of forests.	Miscellaneous expenditure in ranges.	Establishment pay.	Travelling allowances other compensatory and fixed travelling allowance.	Contract and noncontract items.	Total.
		(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1	1920–21 ..	94 4 0	570 11 8	1,923 1 10	719 15 3	16,013 6 5	3,437 10 8	456 5 8	71,079 13 8
2	1921–22 ..	223 5 0	1,074 5 6	2,500 0 2	176 2 0	31,765 2 4	7,919 13 2	1,546 3 4	1,56,777 8 3
3	1922–23 ..	549 13 0	370 4 6	1,954 12 0	71 9 6	26,692 11 9	5,750 15 8	1,089 10 2	60,105 14 1
4	1923–24 ..	735 13 0	120 13 0	564 5 0	11 6 0	28,499 8 10	5,434 6 11	2,787 3 7	54,474 5 2
5	1924–25 ..	1,405 1 6	128 3 0	729 9 0	42 10 6	27,953 11 10	3,959 15 1	1,212 7 5	52,627 10 3
6	1925–26 ..	..	..	..	..	..	..	..	..
7	1926–27 ..	427 14 0	493 12 0	517 13 0	1,261 1 0	37,817 7 3	8,672 11 0	2,623 5 2	72,594 13 5
8	1927–28 ..	578 12 0	216 12 0	582 1 0	568 3 6	24,664 0 2	5,339 6 3	1,611 14 1	67,027 7 0
9	1928–29 ..	532 6 0	320 2 0	340 7 0	26 8 0	24,032 12 9	5,272 11 0	1,596 13 9	56,702 12 0
10	1929–30 ..	515 10 0	358 0 0	575 9 0	94 4 0	25,625 13 6	5,169 13 3	1,465 15 6	55,113 7 9
11	1930–31 ..	1,072 9 0	357 8 0	1,320 8 0	13 8 9	33,132 11 3	6,946 13 6	1,695 13 3	1,52,049 1 7
12	1931–32 ..	756 13 0	324 4 0	118 4 0	16 1 0	29,860 13 0	5,196 0 0	1,478 7 0	1,21,742 14 3
13	1932–33 ..	878 9 0	346 1 0	286 7 0	129 13 4	24,708 9 5	3,884 14 2	1,854 12 6	1,08,571 6 1

Note.—(1) For 1925–26 figures are not available. (2) Capital and ordinary expenditure have not been separated.

Statement of profit and loss from 1920–21 *to* 1932–33.

Serial number.	Year.	Revenue.	Expenditure.	Profit.	Loss.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	
1	1920–21 ..	1,07,193 13 1	71,079 13 8	36,113 15 5	..	Figures for the year 1920–21 are only for 9 months from July to March.
2	1921–22 ..	1,96,821 7 6	1,56,777 8 3	40,043 15 3	..	
3	1922–23 ..	1,17,346 10 3	60,105 14 1	57,240 12 2	..	
4	1923–24 ..	1,24,304 2 6	54,474 5 2	69,829 13 4	..	
5	1924–25 ..	92,042 13 3	52,627 10 3	39,415 3 0	..	
6	1925–26 ..	..	..	..	..	
7	1926–27 ..	95,941 0 8	72,594 13 5	23,346 3 3	..	Figures for the year 1925–26 are not available in the District Forest Office. It is not posted in Form No. 65
8	1927–28 ..	63,107 15 6	67,027 7 0	..	3,919 7 6	
9	1928–29 ..	58,399 2 9	56,702 12 0	1,696 6 9	..	
10	1929–30 ..	51,780 8 6	55,113 7 9	..	3,332 15 3	
11	1930–31 ..	2,31,604 7 11	1 52,049 1 7	79,555 6 4	..	
12	1931–32 ..	1,59,247 4 3	1,21,742 14 3	37,504 6 0	..	
13	1932–33 ..	1,60,103 5 9	1,08,571 6 1	51,531 15 8	.	

183. The above financial summary which shows fluctuating results, is not the result of a normal working of the division due to the following factors :—

(*a*) Prior to 1927, the annual lease value of about Rs. 51,000 on lands assigned to planters was credited to the Forest Department. Since then the tract has been managed by the Revenue Department : and this item of revenue has been lost to the division.

(*b*) The Valparai sleeper operations were conducted by the Forest Engineering Department between the years 1926 to 1930, and revenue and expenditure on this account therefore do not appear in the above statement for those years. Only after 1930, are sleeper extraction costs and revenue shown.

(*c*) After 1930, revenue by the sale of sleepers extracted and sold in previous years has been credited to the division in varying instalments on several occasions in all the years.

184. The cost of the direction establishment (Conservator's establishment) has not been apportioned in the above statement. The average cost of the Conservator's establishment over a period of six years ending 1932–33 is Rs. 47,570 per year for the five divisions of the circle. Taking a fifth of the cost for South Coimbatore and taking 3/8th of the same (paragraph 102) for the working plan area, the share of the direction charges amounts to about Rs. 3,567 per year.

CHAPTER VI.—STATISTICS OF GROWTH AND YIELD.

SECTION 1.—STATISTICS OF GROWTH.

185. *Evergreen species.*—In the absence of well-defined annual rings it has not been found possible to ascertain the rate of growth of the trees in the evergreen forest. Tree increment plots have been laid out by the Provincial Sylviculturist in other similar forests, and it is hoped that by the time the working plan is due for revision, data of growth of evergreen trees will be available, which will permit of calculation of rotation.

186. *Mesua ferrea.*—The following information is available from the files maintained at Dehra Dun. The measurements recorded for the Oghuri plantation, Sibsagar, show that *Mesua ferrea* attains an average breast-height girth of 2 feet in 24 years representing a mean annual girth increment of 1 inch a year. It appears that in the circuit house at Sibsagar, trees 48 years old had a girth of 50 inches. From indirect evidence relating to the Nambor forest reserve, trees 7½ feet in girth have been reckoned to be not less than 100 years of age, and the following provisional figures have been calculated :—

Girth at breast-height.	Age.	Girth at breast-height.	Age.
INCHES.	YEARS.	INCHES.	YEARS.
18	20	54	60
36	40	72	90

Over a period of about 120 years, it appears reasonable to assume that the mean annual girth increment of *Mesua ferrea* would be about three-fourths of an inch. In a period of 120 years, the tree may be expected to grow to a breast-height girth of 7 feet 6 inches.

187. *Deciduous species.*—Teak and rosewood have been planted in the Punachi Working Circle in recent years, and from measurements made of a few individual trees the following data of growth are recorded. The fact that the plantations are not uniformly stocked and have not been properly tended in the past, discounts to a certain extent the value of the observations for comparison with regular plantations :—

Species.	Compartment where measured.	Year of planting.	Age when measured.	Average breast-height girth in inches.	Mean annual girth increment in inches.	Height of dominant trees in feet.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Teak	9 & 10	1916	18	15	0·8	45
	11	1918	16	18	1·1	38
	14-d	1922	12	23	1·9	35
	14-c	1923	11	15	1·4	32
	14-b	1924	10	13	1·3	32
Rosewood ..	9 & 10	1916	18	19	1·1	35
	11	1918	16	15	0·9	35
	14-d	1922	12	15	1·3	35
	14-c	1923	11	17	1·6	30
	14-b	1924	10	10	1·0	30

Logs of teak felled from the natural forest show great variations in growth in addition to the rings on each tree being interspersed with a considerable proportion of false rings. Observations of six logs felled in 1933 showed that trees with a breast-height girth of 7 feet 6 inches corresponded to an age of nearly 120 years.

188. Fuel species such as *Acacia leucophlœa*, *Albizzia amara* and *Azadirachta indica* in the poorer quality soils were found to be putting on an average girth increment of about half an inch a year over periods of ten to fifteen years. Due however to the variations in the quality of the soils, it is difficult to reckon on any definite growth rate for even a whole coupe. It would however be safe to count on such species producing stems with a breast-height girth of not less than 20 inches on a rotation of 40 years in the poorer soils.

SECTION 2.—YIELD TABLES.

189. From measurements of about a thousand trees felled in the Kal=Ar valley in the past, and converted into railway sleepers, the following sleeper outturn and timber volume tables have been compiled by the Provincial Sylviculturist. The yield tables are applicable to the Kal=Ar valley where the quality of the trees is homogeneous :—

A local assortment table for Mesua ferrea in the Kal=Ar valley, showing the average volume of timber in cubic feet and the average outturn of sleepers in Broad-Gauge units per tree for trees of given girth at breast-height over bark.

(Prepared from data of actual outturn from 985 trees felled.)

NOTE.—Figures for trees of 10 feet girth and over are not accurate and must be used with caution.

Breast-height girth over bark.	Volume of timber in cubic feet.	Outturn of sleepers. in B.G. units.	Breast-height girth over bark.	Volume of timber in cubic feet.	Outturn of sleepers in B.G. units.
(1)	(2)	(3)	(1)	(2)	(3)
4′ 0″	26	4·5	12′ 3″	152	20·5
4′ 3″	28	4·9	12′ 6″	154	21·0
4′ 6″	31	5·3	12′ 9″	156	21·3
4′ 9″	33	5·7	13′ 0″	158	21·8
5′0″	36	6·2	13′ 3″	160	22·0
5′ 3″	40	6·7	13′ 6″	162	22·3
5′ 6″	43	7·2	13′ 9″	163	22·8
5′ 9″	46	7·8	14′ 0″	165	23·0
6′ 0″	50	8·3	14′ 3″	166	23·3
6′ 3″	55	8·9	14′ 6″	168	23·5
6′ 6″	59	9·4	14′ 9″	169	23·8
6′ 9″	64	10·1	15′ 0″	170·5	24·3
7′ 0″	68	10·7	15′ 3″	172	24·5
7′ 3″	73	11·3	15′ 6″	173	24·8
7′ 6″	78	11·9	15′ 9″	174·5	25·0
7′ 9″	84	12·6	16′ 0″	176	25·0
8′ 0″	88·5	13·1	16′ 3″	177	25·5
8′ 3″	93	13·7	16′ 6″	178	25·5
8′ 6″	99	14·2	16′ 9″	179	25·8
8′ 9″	104	14·8	17′ 0″	180	26·0
9′ 0″	109	15·3	17′ 3″	182	26·3
9′ 3″	114	15·8	17′ 6″	183	26·3
9′ 6″	118·5	16·3	17′ 9″	184	26·5
9′ 9″	122·5	16·8	18′ 0″	184·5	26·8
10′ 0″	126	17·0	18′ 3″	185	26·8
10′ 3″	130	17·5	18′ 6″	186	27·0
10′ 6″	134	18·0	18′ 9″	187	27·3
10′ 9″	137	18·3	19′ 0″	188	27·3
11′ 0″	140	18·8	19′ 3″	189	27·5
11′ 3″	143	19·0	19′ 6″	189·5	27·5
11′ 6″	145·5	19·5	19′ 9″	190	27·8
11′ 9″	148	19·8	20′ 0″	191	28·0
12′ 0″	150	20·3			

CHAPTER VII.—CAPITAL VALUE OF THE FOREST.

190. There is no basis for the determination of the capital value of the forest, and hence an estimation of it has not been attempted.

PART II.

Future Management discussed and prescribed.

CHAPTER I.—BASIS OF PROPOSALS.

SECTION 1.—OBJECTS OF MANAGEMENT.

191. In the management of these forests, the aim should be the following :—

(a) Protection and conservation of the forests on steep hillsides and high hill ranges which form the catchment area of the streams flowing into the taluks of Pollachi, Udamalpet, Dharapuram and Karur.

(b) Provision of a sustained annual yield of timber, fuel and bamboos for the population of the surrounding villages to the full extent of which the forests are capable, from the economically workable areas, thereby enhancing the revenue.

(c) Exploitation of mature and marketable trees which would otherwise deteriorate in the shola forests.

(d) Improvement of the quality of the forests by regenerating them with the more useful and valuable species wherever exploitation is undertaken or conditions are suitable.

192. These forests are valuable owing to their importance as catchment areas for all the streams flowing from them which feed the irrigation tanks and channels of Pollachi, Udamalpet, Dharapuram and Karur taluks. They form also the most important and the nearest source of supply of forest produce to the inhabitants of these taluks. The limits of cultivation in the adjoining villages have extended practically to the foot of the hills, and the forests to be managed are mostly on sloping round. Careful management is therefore essential to ensure the attainment of these objects.

SECTION 2.—METHODS OF TREATMENT.

193. The types of forest growth dealt with vary greatly and in each type the variations in quality are considerable. The prescriptions for working are based on the knowledge and experience gained in the past treatment of these and similar forests elsewhere, modified, wherever necessary, in the light of the results achieved by the Provincial Sylviculturist's experiments in the forests of the Presidency.

194. In the best and most accessible evergreen forests, selection fellings of mature and marketable trees are prescribed, with artificial regeneration of the resulting gaps to supplement such natural regeneration as already exists. The accessible deciduous timber forests are selected for clear-felling and concentrated artificial regeneration. The degraded or the poorer quality deciduous forests are earmarked for the production of domestic fuel and small timber for the agriculturist ; the treatment is clear-felling of coupes on a suitable rotation, burning the brushwood and dibbling the seed of fuel species under what is now familiarly styled " Rab " regeneration. Exploitation of bamboos and minor forest produce is provided for, and in the remoter forests the establishment of sandal propagation centres in suitable localities is contemplated.

SECTION 3.—WORKING CIRCLES AND THEIR CONSTITUTION.

195. The following working circles have been constituted :—

(a) A Selection Working Circle for the most accessible of the evergreen forests.

(b) A Plantation Working Circle for the deciduous timber forests of Punachi.

(c) A Clear-felling Fuel Working Circle for the forests on the outer slopes, mainly.

(d) A Bamboo Working Circle.

(e) A Sandal Propagation Working Circle.

(f) A minor Forest Produce Working Circle.

(g) A Grazing Working Circle.

(h) A Protection Working Circle.

SECTION 4.—PERIOD OF THE WORKING PLAN AND NECESSITY FOR REVISION.

196. This working plan is for a period of ten years from 1935–36 to 1944–45, and prescriptions have been made for this period. The necessity for undertaking a revision of the working plan before the working plan expires, is emphasized. Minor alterations in the prescriptions for treatment may be advisable, if warranted by circumstances, but it is desirable that the systems of treatment advocated should be steadily pursued for a period of ten years.

CHAPTER II.—WORKING PLAN FOR THE SELECTION WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE CIRCLE AND CHARACTER OF THE VEGETATION.

197. The Selection Working Circle is formed in the best of the most accessible evergreen forests in the division. It lies within the area originally earmarked by Government for the formation of Cinchona plantations, but it is not expected that this locality will be taken up for such planting at any early date, if at all, as considerable areas more suited for Cinchona are still available for planting outside this working circle. The area of the wroking circle is 4,885 acres of which 1,201 acres is north of the Kal-Ar and 3,684 acres is south of it. It forms a single felling series known as the Kal-Ar Felling Series.

198. *Vegetation.*—The vegetation of the working circle is completely evergreen. The elevation varies from 3,000 to 5,000 feet above sea level. The important species found are *Mesua ferrea, Pœciloneuron indicum, Heritiera papilio, Cullenia excelsa, Cedrela Toona, Mastixia arborea, Pygeum Wightianum, Dichopsis elliptica, Meliosma* spp., *Cryptocarya* spp., etc. The distribution of the age-classes is generally satisfactory.

199. Enumerations made of trees of the more important species of 3 feet in girth and above at breast height ($4\frac{1}{2}$ feet from ground level) revealed the following percentages in the whole working circle :—

Statement showing percentage of species in the working circle.

Serial number and Species. (1)	Ttotal number of trees over 3 feet in girth at B.H. (2)	Percentage of each species to the total number of trees. (3)	Serial number and Species. (1)	Total number of trees over 3 feet in girth at B.H. (2)	Percentage of each species to the total number or trees. (3)
1 Mesua ferrae ..	59,010	53	10 Acrocarpus fraxinifolius.	3	Nil.
2 Poecileneuran indica.	24,188	22	11 Bischofia javanica ..	3	Nil.
3 Dichopsis elliptica ..	17,298	15	12 Artocarpus hirsuta ..	Nil.	Nil.
4 Heritoria papilio ..	4,789	4	13 Hopea parviflora ..	Nil.	Nil
5 Artocarpus integrifolia.	3,695	3	14 Filicium descipiens ..	Nil.	Nil.
6 Calophyllum tomentosum.	2,171	2	15 Chickrassia tabularis.	Nil.	Nil.
7 Cedrela toona ..	656	1	16 Hardwickia pinnata..	Nil.	Nil.
8 Dysoxylum malabaricum.	157	0·1	17 Dipterocarpus indicus.	Nil.	Nil.
9 Dyospyros species ..	42	Nil.	18 Vateria indica ..	Nil.	Nil.
			Total number of trees ..	**1,12,012**	**100·1**

SECTION 2.—DIVISION OF THE AREA.

200. With reference to the base and strip lines cut during the enumeration of the forest, the area has been divided into ten coupes which have been indicated on the working plan maps.

SECTION 3.—ANALYSIS AND VALUATION OF THE CROP.

201. The more important timber species were enumerated over the whole working circle. A few convenient base lines were cut for the purpose, all the lines being tied to the starting point, which is the southern end of the suspension bridge across the Kal-Ar. Strip lines were cut at right angles to the base line at 4 and 2 chain intervals on the base line. The base lines were all measured and surveyed with trailer tape and compass; the strip lines were also measured in order to get a correct location on the maps of the extent of the sholas enumerated. The trees on the 2-chain wide strips were enumerated, omitting the alternating 4-chain wide strips and thus over a third of the area scattered all over the working circle, the stand of timber is known accurately. Obviously unsound trees were not enumerated.

202. The species enumerated were *Mesua ferrea*, *Pœciloneuron indicum*, *Cedrela Toona*, *Artocarpus integrifolia*, *Dysoxylum malabaricum*, etc., as given in paragraph 199.

203. The statement given below in paragraph 204 shows the results of the enumerations arranged into ten coupes. In this statement the number of trees given in each girth class is the actual number enumerated in the two-chain wide strips. This number should be multiplied by three in order to arrive at the probable number in the whole working circle as has been done in column 15 of the statement for trees over 7 feet in girth.

204. It is important to state that in calculating the yield the presumption has been made that three times the number of trees actually enumerated over a third of the area is to be found over the whole working circle. As an experiment, with a view to verifying this assumption, an enumeration was made of 4-chain wide strips over 216 acres and the stand was found to be twice the stand in the immediately adjacent two-chain strips of 108 acres with but negligible differences. In the case of widely distributed species such as *Mesua ferrea*, the presumption should be dependably accurate. With sparingly distributed species such as *Cedrela Toona*, it is emphasized that it will be unsafe to depend on the existence of three times the enumerated stand over the whole working circle.

Tabular statement of fellings and statement of trees enumerated and of the expected number of trees over 7 feet girth in the ten coupes.

Coupe number.	Area in acres.	Species.	Number of trees actually enumerated in feet girth classes.										Total number of trees over 7′ girth.	
			3′–4′	4′–5′	5′–6′	6′–7′	7′–8′	8′–9′	9′–10′	10′–11′	11′–12′	Above 12′	Actually enumerated.	Expected in the whole coupe.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
I	616·9	Mesua ferrea	576	525	395	296	205	187	45	29	13	5	484	1,229
		Poeciloneuron indica	13	8	9	7	3	6	4	6	3	3	25	66
		Dichopsis elliptica	71	73	43	27	13	4	1	1	..	..	19	57
		Cedrela toona	8	12	10	10	4	7	6	8	2	2	29	80
		Dysoxylum malabaricum	..	..	..	..	..	..	..	..	..	..	..	..
		Calophyllum	18	25	21	19	33	10	12	6	5	..	66	182
		Artocarpus integrifolia	41	37	29	23	23	6	6	3	3	1	42	116
		Heritiera papilio	166	162	133	85	67	36	14	11	5	6	139	384
II	593·5	Mesua ferrea	561	546	413	319	208	123	40	19	20	6	416	1,237
		Poeciloneuron indica	5	1	1	2	..	..	..	..	..	..	..	..
		Dichopsis elliptica	4	3	2	..	..	..	..	..	..	..	..	..
		Cedrela toona	2	3	3	2	1	2	1	1	..	2	7	19
		Dysoxylum malabaricum	..	..	..	..	1	..	..	..	..	..	1	3
		Calophyllum	17	26	23	22	24	25	5	2	2	3	61	168
		Artocarpus integrifolia	23	27	20	18	14	6	2	2	2	..	26	72
		Heritiera papilio	107	102	74	79	47	33	10	5	2	2	99	273
III	448·4	Mesua ferrea	515	336	307	241	207	112	69	39	22	5	454	1,251
		Poeciloneuron indica	..	1	..	..	..	..	..	..	..	..	..	..
		Dichopsis elliptica	258	205	151	91	33	12	4	3	..	..	52	141
		Cedrela toona	2	3	3	5	3	3	2	2	1	..	11	33
		Dysoxylum malabaricum	2	1	3	3	2	1	..	..	..	..	3	9
		Calophyllum	12	12	13	8	13	9	6	4	4	..	36	108
		Artocarpus integrifolia	21	32	26	21	21	9	2	5	1	1	39	119
		Heritiera papilio	45	32	47	28	23	14	8	7	4	4	60	183
IV	336·0	Mesua ferrea	505	495	354	272	221	109	47	42	14	8	441	1,257
		Poeciloneuron indica	..	..	..	..	..	..	..	..	..	..	..	..
		Dichopsis elliptica	116	104	74	39	29	14	3	6	1	..	53	149
		Cedrela toona	3	2	3	4	7	..	1	..	..	1	9	27
		Dysoxylum malabaricum	3	1	1	2	5	1	..	..	..	..	6	18
		Calophyllum	8	16	8	11	9	7	4	2	..	1	23	70
		Artocarpus integrifolia	8	22	19	16	20	13	5	..	1	..	39	119
		Heritiera papilio	14	24	6	7	5	8	5	7	3	2	30	92
V	360·2	Mesua ferrea	374	325	240	213	168	103	44	43	26	1	385	1,330
		Poeciloneuron indica	..	..	..	..	..	..	..	..	..	..	..	..
		Dichopsis elliptica	96	86	69	33	19	14	8	3	..	..	44	128
		Cedrela toona	..	..	1	..	4	..	..	..	..	..	4	12
		Dysoxylum malabaricum	..	..	1	2	1	..	..	..	..	..	1	3
		Calophyllum	7	3	11	8	12	1	2	2	..	..	17	52
		Artocarpus integrifolia	12	11	16	12	12	8	1	2	2	1	26	79
		Heritiera papilio	18	19	19	17	15	13	8	4	5	2	47	143

Tabular statement of fellings and statement of trees enumerated and of the expected number of trees over 7 feet girth in the ten coupes—cont.

Coupe number.	Area in acres.	Species.	Number of trees actually enumerated in feet girth classes.										Total number of trees over 7′ girth.	
			3′–4′	4′–5′	5′–6′	6′–7′	7′–8′	8′–9′	9′–10′	10′–11′	11′–12′	Above 12′	Actually enumerated.	Expected in the whole coupe.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
VI	290·0	Mesua ferrea	505	403	310	221	214	93	39	25	16	4	391	1,231
		Poeciloneuron indica	35	23	21	9	22	27	10	12	16	..	87	317
		Dichopsis elliptica	132	150	100	63	24	14	6	5	4	1	54	159
		Cedrela toona	1	3	3	2	4	2	1	..	2	1	10	30
		Dysoxylum malabaricum	1	4	2	2	3	..	1	..	..	..	4	12
		Calophyllum	7	5	7	6	8	4	5	2	..	..	19	58
		Artocarpus integrifolia	6	23	14	12	7	5	3	..	..	..	15	46
		Heritiera papilio	3	8	10	5	10	5	1	1	2	..	19	58
VII	479·0	Mesua ferrea	535	494	360	304	229	129	57	33	11	..	459	1,323
		Poeciloneuron indica	309	226	164	163	179	147	83	77	46	7	539	1,509
		Dichopsis elliptica	184	204	150	80	50	18	8	3	2	..	81	228
		Cedrela toona	7	2	2	3	3	..	..	2	3	..	8	24
		Dysoxylum malabaricum	7	3	4	1	1	1	..	..	..	..	2	6
		Calophyllum	7	6	3	3	3	8	2	..	..	..	13	40
		Artocarpus integrifolia	21	39	22	27	10	14	6	5	..	1	36	110
		Heritiera papilio	8	6	6	5	10	8	2	3	1	..	24	73
VIII	559·6	Mesua ferrea	442	402	295	236	251	139	53	34	13	2	492	1,421
		Peociloneuron indica	369	366	224	228	263	206	95	128	86	4	782	2,346
		Dichopsis elliptica	111	99	59	28	21	8	1	..	..	..	30	92
		Cedrela toona	5	2	2	2	4	3	4	3	1	..	15	38
		Dysoxylum malabaricum	..	..	..	..	..	..	..	..	..	..	..	..
		Calophyllum	3	12	9	6	8	6	..	1	1	..	16	40
		Artocarpus integrifolia	60	62	45	37	25	11	1	1	..	..	38	96
		Heritiera papilio	8	5	4	8	5	6	3	2	..	..	16	40
IX	599·1	Mesua ferrea	396	350	311	277	214	111	59	43	23	1	451	1,366
		Poeciloneurcn indica	288	246	224	189	191	132	70	96	44	..	533	1,611
		Dichopsis elliptica	428	365	286	103	69	17	7	2	1	..	96	277
		Cedrela toona	1	..	..	1	1	1	..	..	1	..	3	9
		Dysoxylum malabaricum	..	..	..	..	..	..	..	..	..	..	..	..
		Callophyllum	14	3	7	12	6	5	3	6	4	..	24	73
		Artocarpus integrifolia	15	30	18	13	5	5	1	..	..	..	11	33
		Heritiera papilio	2	+ 1	2	1	..	..	2	1	2	..	5	15
X	602·1	Mesua ferrea	444	406	369	296	249	136	70	48	28	1	532	1,536
		Poeciloneurcn indica	386	272	245	239	213	206	123	95	75	3	715	2,127
		Dichopsis elliptica	432	341	202	121	68	25	4	..	..	..	97	281
		Cedrela toona	1	2	3	1	1	2	3	..	1	..	7	21
		Dysoxylum malabaricum	..	..	..	..	..	..	..	..	..	..	..	..
		Calophyllum	1	10	8	12	3	3	3	3	1	..	13	40
		Artocarpus integrifolia	13	23	20	13	9	2	..	..	..	..	11	33
		Heritiera papilio	4	..	3	3	1	..	..	..	..	..	1	3

SECTION 4.—METHOD OF TREATMENT.

205. The object of management in this working circle is the exploitation of mature trees as they become marketable, and the improvement of the stocking of the valuable species, whilst preserving the evergreen character of the forest. Since heavy fellings cause a deterioration of the evergreen forests, the method of treatment should be a restricted selection system.

206. *Sylvicultural system.*—The forests will be worked on a selection system under which mature trees alone will be extracted, and even these fellings will be subject to a strict limit in the number cut per acre, so as not to cause a dangerous opening of the canopy. In the gaps created by the fellings, the natural regeneration will be supplemented wherever necessary by artificial regeneration.

207. *Exploitable size.*—At present the chief demand from this type of forest is for railway sleepers. A small demand for *Cedrela Toona* for Cigar boxes also exists. The inaccessibility and difficult nature of the country in these forests rules out the economic extraction of timber as logs. *Mesua ferrea* is the only species in these forests which can be used as a sleeper without preservative treatment and the demand will be for it only, for some years to come. Prices of sleepers are now low and rule out the question of economic extraction from many such remote forests, but it is expected that conditions will improve at an early date. Broad-gauge sleepers fetch better prices than metre-gauge sleepers as the bigger trees necessary for their production are comparatively scarce in the more accessible privately-owned forests from which supplies are now mainly drawn. The minimum size of a tree suitable for the production of broad-gauge sleepers is found to be a girth of about 6 feet at breast height 4 feet 6 inches from the ground. The greater the girth, the more the yield of sleepers per tree, provided the tree is sound. Lack of accurate data of the growth of *Mesua ferrea* renders the determination of the culmination of its rate of growth now impossible. Grown even under very favourable conditions it is found that *Mesua ferrea* develops heart rot at an uncertain age, and this prevents the retention of the tree for a very long period because the consequent risk of loss of increment is great. The bigger the trees selected for extraction, the more scattered they are found in these primæval forests, and remembering that the country is difficult of access the proportionate increase in cost of extraction is considerable. Large capital outlay in extending roads or erecting a power ropeway will be necessary to make extraction feasible from the locality and it is necessary that exploitations should be as concentrated as possible. As a compromise of all these considerations the minimum girth of trees to be marked for felling is fixed at 7 feet, the measurement to be made 4½ feet from the ground, on the uphill side if the tree stands on a slope. The same girth-limit should apply for trees of other species should demand necessitate their extraction.

208. *Rotation.*—Consideration of rotation is of academic interest at present. If figures of growth of *Mesua ferrea* in Assam be applied to this locality a girth of 7 feet (breast height) will be attained in about 112 years. Tree increment plots have already been formed in two or other divisions, the Wynaad and Palghat, under the control of the Provincial Sylviculturist, and by the time this working plan is revised, in about 1943–44, there should be reliable figures of rate of growth available.

209. *Felling cycle.*—With a view to extracting mature trees as quickly as possible and at the same time keeping the size of the coupes within manageable limits, the felling cycle is fixed at ten years and it is hoped that it will be possible to work over the whole area within the period of the working plan. The whole felling series has accordingly been divided into ten coupes.

210. *Coupes.*—With a felling cycle of ten years, the size of the coupes varies from 300 to about 600 acres, the variation being due to the uneven distribution of *Mesua ferrea*,—the yield of sleepers from which has been equalized as far as possible over the ten years.

211. *Calculation of the yield.*—As stated in paragraph 204, the calculation of the yield is on the assumption that three times the number of trees actually enumerated is to be found over the whole area. A yield table compiled from the trees felled and converted in the past, has been applied to the expected number of trees and the probable outturn of broad-gauge (B.G.) sleepers is given in paragraph 224.

212. Although coupes have been formed with a view to equalization of the number of *Mesua ferrea* over 7 feet in breast height girth, the yield will be fixed by area. It is prescribed that each year one coupe be worked. During the period of the working plan the aim is to remove mature trees from over the whole working circle.

SECTION 5.—EXPLOITATION.

213. *Coupe maps.*—Annually in January, the District Forest Officer will have a map on a scale of 16 inches to 1 mile prepared for the coupe proposed for exploitation during the ensuing official year. This gives a square inch of space for every $2\frac{1}{2}$ acres and on this map is to be indicated the position of the trees extracted, sawpits, extraction paths and gaps chosen for regeneration. It is important that the map should be maintained as correctly as possible, though it is realized that on an enlargement from the 4 inches to 1 mile map nothing more than the approximate position of the gaps and so on, can be shown in relation to the drag paths. Four copies of the map will be required; one for the regeneration ledger, one for the control journal and two for field use and for the Range Officer.

214. *Marking rules.*—During the months of January and February, the trees for felling should be marked by an officer not lower in rank than a Ranger and estimates prepared for the extraction. A gazetted officer must check as much of the marking as possible every year; and it is suggested that 10 per cent of the marking should be looked upon as a minimum for this purpose. The following rules should be observed:—

(*a*) Only species for which there is a specific demand should be marked.

(*b*) Trees with a girth of 7 feet or more at $4\frac{1}{2}$ feet from the ground (on the uphill side over sloping ground) may alone be marked.

(*c*) If the demand is for *Mesua ferrea* only, all trees wtih a girth of 7 feet or more *may be marked* though it is not prescribed that they *must* all be marked. (Enumerations show that the average number of such trees in the best coupe is only 4 per acre, so that any excessive opening of the canopy need not be feared by their complete removal.)

(*d*) If species other than *Mesua ferrea* are in demand, the following restriction should be imposed:—

(i) The trees marked for felling should be at least 60 feet apart from each other, an exception being that when two trees are so close to each other that they may both be felled to form only one gap, both may be marked for felling.

(ii) From each individual acre not more than 4 trees may be removed and must be indicated on the coupe map prescribed in paragraph 213.

(*e*) The marking should proceed systematically, in serial order from one end of the coupe to the other.

(*f*) The trees marked for felling should have numbers engraved on them in two positions so that after felling the stump as well as the tree may be identified.

(*g*) All climbers on trees marked as well as on neighbouring trees should be cut at the time of marking, effectively, so that when felling takes place, the damage to neighbouring trees may be minimised.

(*h*) The marking officer should estimate the height of bole of the trees marked and form an estimate of the timber contents, and in the case of *Mesua*, of the number of broad-gauge sleepers that may be obtained from the tree and enter it in the appropriate column of the marking register to serve as a basis for the preparation of estimates for felling and conversion.

(*i*) Trees which are unsound *need not* be marked for felling as they will produce seed; they will naturally die in course of time without making an appreciable opening in the canopy.

(*j*) Where unsound trees exist close to a sound tree marked for extraction, the unsound tree should also be marked for felling so that together a convenient gap may be caused for artificial regeneration.

215. *Felling and conversion.*—The advantage of exploitation through the agency of contractors who have successfully worked in this locality should be borne in mind. The felling of marked trees should be done with care and as far as possible in a direction in which the falling crown will cause the least damage. Adjacent trees should be felled in such a way that they will make a single gap. *Mesua* timber being subject to felling shatter, great care and close supervision is necessary in the felling operations. Trees should be felled as low as possible, and when feasible, uphill.

216. Directly the tree falls, it is essential that such of the natural regeneration and young growth as can be saved, be freed from the fallen crown. A little immediate care will go a long way to effect this. All damaged seedlings should be cut back close to the ground.

217. Logging should proceed simultaneously with felling and the trees felled should not be left unlogged for more than 24 hours. This rule will stimulate the operation of freeing existing natural regeneration from the fallen crown. Logging of *Mesua* should

be primarily for the production of broad-gauge sleepers. In this respect no hard and fast rule can be laid down as each tree is to be dealt with in a different manner. Metre-gauge sleepers are to be looked upon as the outturn of the inevitable waste in the conversion of the broad-gauge sleepers.

218. In erecting saw platforms, the sawyers should be prohibited from felling the poles of the more important species of trees such as *Mesua ferrea*, *Poeciloneuron indicum*, *Cedrela Toona* and *Dichopsis elliptica*, unless they have been broken or damaged beyond recovery by the fall of other trees. They should be made to fell and make use of damaged trees not fit for conversion, or trees of inferior species, and in making such fellings, they should not fell trees standing on the edge of a gap unless specially instructed to do so in order to enlarge the gap for regeneration purposes.

219. The sawyers usually employed are skilled in the work and know exactly what sizes are to be sawn ; nevertheless, there must be strict supervision to ensure that undersized sleepers are not produced. Mistakes in conversion result in the production of metre-gauge sleepers which are uneconomical and should be guarded against.

220. The specification for sleepers acceptable to the railways is given in the Madras Forest Pocket Book, and these specifications with such modifications as may be made from time to time by the Forest Utilization Officer should be adhered to.

221. Sawing at stump site and manual haulage of the sleepers to central depots, which is the custom in the locality, is suited to the nature of the country and should be continued. Animal labour for dragging logs or sleepers has not been found more economical in other similar forests.

222. For the fellings, the forms and registers prescribed in the Madras Forest Department and Account Code should be maintained. These are code forms 3, 4 and 5. The registers and the depots should be inspected by the District Forest Officer or his assistant at least once a year, and the fellings and conversion supervised as often as possible. At the end of each year's operations, an extract should be prepared showing the number of trees felled, the percentage of hollowness, and the yield of sleepers, etc., in the manner given in the statement under paragraphs 58 and 224 and filed with the control journal for the working circle and submitted with it to the Conservator at the time the control returns are submitted.

223. *Order of felling.*—All parts of the working circle are much alike in point of maturity of the standing trees, and the order of the coupes laid down is not based on purely sylvicultural considerations, but rather in accordance with the convenience of exploitation.

224. *Forecast of yield.*—The total number of trees of the various species from each coupe is indicated in the statement in paragraph 204. For *Mesua ferrea* the yield is difficult to determine accurately owing to the incidence of hollowness. Sharp variations in height growth of trees within the same coupe makes the application of volume tables difficult without a separation of quality classes. From an analysis of the results of past working the percentage of unsoundness and the yield of sleepers has been found to be as given in the statements in paragraphs 58 and 189. Applying these figures the probable yield of sleepers from the various coupes is forecasted in the following statement, but it cannot be expected to be exact.

Statement showing the probable yield of sleepers in the Selection Working Circle coupes.

Particulars.	Coupe number.	Girth classes.												Total.
		7′–8′	8′–9′	9′–10′	10′–11′	11′–12′	12′–13′	13′–14′	14′–15′	15′–16′	16′–17′	17′–18′	18′–19′	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Number of trees expected	..	521	475	114	73	33	7	3	3	..	..	..	..	1,229 trees.
Number of trees expected to be sound ..	..	335	327	82	53	22	5	2	2	..	..	..	..	828 ,,
Gross volume of logs in cubic feet ..	I	26,130	32,373	9,676	7,102	3,201	770	324	336	..	..	..	..	79,912 c.ft.
Net outturn of sleepers in cubic feet ..	..	11,958	13,929	3,996	2,862	1,287	315	135	141	..	..	..	..	34,623 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers	..	3,986	4,643	1,332	954	429	105	45	47	..	..	..	..	11,541
Number of trees expected	..	619	366	119	56	59	6	9	..	..	..	3	..	1,237 trees
Number of trees expected to be sound ..	..	399	252	86	41	38	4	6	..	..	..	3	..	820 ,,
Gross volume of logs in cubic feet ..	II	31,122	25,948	10,148	5,494	5,529	616	972	..	..	..	549	..	80,378 c.ft.
Net outturn of sleepers in cubic feet ..	..	14,244	10,734	4,191	2,214	2,223	252	399	..	..	..	237	..	34,494 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers.	..	4,748	3,578	1,397	738	741	84	133	..	..	..	79	..	11,498
Number of trees expected	..	570	308	190	108	61	8	..	3	..	3	..	..	1,251 trees
Number of trees expected to be sound ..	..	367	212	137	79	40	5	..	2	..	..	..	..	842 ,,
Gross volume of logs in cubic feet ..	III	28,626	20,988	16,166	10,586	5,820	770	..	336	..	..	..	..	83,292 c.ft.
Net outturn of sleepers in cubic feet ..	..	13,101	9,030	6,678	4,266	2,340	315	..	141	..	..	..	..	35,871 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers.	..	4,367	3,010	2,226	1,422	780	105	..	47	..	..	..	..	11,957
Number of trees expected	..	630	310	134	120	40	23	trees of all girth classes above 12 feet in girth ..						1,257 trees.
Number of trees expected to be sound ..	..	405	213	97	88	26	12	Do. do. ..						841 ,,
Gross volume of logs in cubic feet ..	IV	31,590	21,087	11,446	11,792	3,783	2,036	(Average cubical contents for the 6 girth classes has been taken.)						81,734 c.ft.
Net outturn of sleepers in cubic feet ..	..	14,457	9,072	4,548	4,752	1,521	858	..	..	..	..	..	..	35,208 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers	..	4,819	3,024	1,516	1,584	507	286	..	..	..	..	..	..	11,736
Number of trees expected	..	580	356	152	149	90	3	trees of all girth classes above 12 feet in girth ..						1,330 trees.
Number of trees expected to be sound ..	..	373	245	110	109	59	2	Do. do. ..						898 ,,
Gross volume of logs in cubic feet ..	V	29,094	24,255	13,035	14,606	8,585	339	(Average cubical contents for the 6 girth classes has been taken.)						89,914 c.ft.
Net outturn of sleepers in cubic feet ..	..	13,314	10,437	5,361	5,886	3,450	144	..	..	..	..	..	..	38,592 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers	..	4,438	3,479	1,787	1,962	1,150	48	..	..	..	..	..	..	12,864
Number of trees expected	..	673	293	123	79	50	13	trees of all girth classes above 12 feet in girth						1,231 trees.
Number of trees expected to be sound ..	..	432	201	88	57	33	7	Do. do.						818 ,,
Gross volume of logs in cubic feet ..	VI	33,696	19,899	10,428	7,638	4,802	1,188	..	..	..	..	..	..	77,651 c.ft.
Net outturn of sleepers in cubic feet ..	..	15,420	8,562	4,290	3,078	1,929	501	..	..	..	..	..	..	33,780 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers.	..	5,140	2,854	1,430	1,026	643	167	..	..	..	..	..	..	11,260
Number of trees expected	..	660	372	164	95	32	..	..	..	..	..	..	..	1,323 trees.
Number of trees expected to be sound ..	..	425	256	118	69	21	..	..	..	..	..	..	..	889 ,,
Gross volume of sleepers in cubic feet ..	VII	33,150	25,344	13,983	9,246	3,056	..	..	..	..	..	..	..	84,779 c.ft.
Net outturn of sleepers in cubic feet ..	..	15,174	10,905	5,751	3,726	1,227	..	..	..	..	..	..	..	36,783 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers.	..	5,058	3,635	1,917	1,242	409	..	..	..	..	..	..	..	12,261

Number of trees expected	..	726	401	153	98	37	6	..	..	..	..	..	..	1,421 tees
Number of trees expected to be sound ..	..	467	276	90	72	24	3	..	..	..	..	..	..	932 ,,
Gross volume of sleepers in cubic feet ..	VIII	36,426	27,335	10,665	9,648	3,492	509	..	..	..	..	..	..	88,075 c.ft.
Net outturn of sleepers in cubic feet ..	..	16,674	9,357	4,386	3,888	1,404	216	..	..	..	..	..	..	35,925 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers.	..	5,558	3,119	1,462	1,296	468	72	..	..	..	..	..	..	11,975
Number of trees expected	..	647	337	179	130	70	..	..	..	..	..	..	..	1,366 trees.
Number of trees expected to be sound ..	..	416	232	129	95	46	..	..	..	..	..	..	..	918 ,,
Gross volume of sleepers in cubic feet ..	IX	32,448	22,968	15,287	12,730	6,693	..	..	..	..	..	..	..	90,126 c.ft.
Net outturn of sleepers in cubic feet ..	..	14,850	9,882	6,288	5,630	2,691	..	..	..	..	..	..	..	38,841 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers.	..	4,950	3,294	2,096	1,710	897	..	..	..	..	..	..	..	12,947
Number of trees expected	..	719	392	202	139	81	..	..	3	..	..	..	..	1,536 trees.
Number of trees expected to be sound ..	..	462	270	146	102	53	..	..	2	..	..	..	..	1,035 ,,
Gross volume of logs in cubic feet ..	X	36,036	26,730	17,301	13,668	7,712	..	..	336	..	..	..	..	101,783 c.ft.
Net outturn of sleepers in cubic feet ..	..	16,494	11,502	7,116	5,508	3,099	..	..	141	..	..	..	..	43,860 ,,
Net outturn of sleepers in number of Broad-Gauge sleepers.	..	5,498	3,834	2,372	1,836	1,033	..	..	47	..	..	..	..	14,620

225. From the statement it is clear that provided the quality and percentage of unsoundness remains what it has been in the past and provided that three times the number of trees actually enumerated are obtained from the coupe, an average annual outturn of 12,265 broad-gauge sleepers may be obtained for the next ten years.

SECTION 6.—REGENERATION.

226. Natural regeneration of tree species is generally abundant, but to replace the damage caused by the fellings and to increase the proportion of the valuable species in the forest, artificial regeneration of some kind is necessary. Many of the gaps caused by selection fellings in such forests are small and will naturally close up within a short period; in such gaps artificial regeneration need not be attempted. Examination of past fellings shows that nearly 50 per cent of such gaps do not require artificial regeneration for this reason. As referred to in paragraph 38, abundant natural regeneration exists all over the forest.

227. Artificial regeneration of gaps in the evergreen forest is yet in an experimental stage and each year's operations should be modified in the light of experience. The Provincial Sylviculturist should be consulted annually and suitable modifications in the prescriptions that follow should be made.

228. *Choice of species.*—The choice of the valuable species suited for regeneration in evergreen forests is limited, and the high elevation of these forests further restricts the number, many of which will thrive at lower elevations. The following species are recommended for trial :—

Acrocarpus fraxinifolius (in large gaps only),
Cedrela Toona,
Dysoxylum malabaricum,
Artocarpus hirsuta,
Dipterocarpus Bourdilloni and
Gluta travancorica.

Species such as *Mesua ferrea* and *Dichopsis elliptica*, natural regeneration of which is already abundant in these forests, are not recommended. There have hitherto been no attempts at artificial regeneration in these forests and the prescriptions now made are based on experience of regeneration in similar forests elsewhere.

229. *Selection of gaps for regeneration.*—The following rules for the selection of gaps for regeneration should be observed :—

(*a*) Gaps less than about 200 square yards in extent and also those less than about 10 yards wide may be left to nature.

(*b*) Gaps containing enough poles or advanced growth of *Mesua ferrea* or *Dysoxylum malabaricum* or *Cedrela Toona* should be omitted.

(*c*) Gaps which have a sufficient number of *Mesua ferrea*, *Cedrela Toona* or *Dysoxylum malabaricum* seedlings will be left to nature. To define a sufficient number of seedlings is difficult. But in an average-sized gap an arbitrary number of fifteen established seedlings of any of the species named above may be accepted.

(*d*) Gaps which do not come under any of the above categories will be selected for artificial regeneration.

230. As far as possible the District Forest Officer should personally inspect the gaps selected for artificial regeneration, as well as a large number of those rejected. Selection of the gaps for regeneration may be made directly the fellings are over and whenever an officer inspects the locality. The gaps selected for regeneration should have the number of the felled tree and also the year of regeneration engraved clearly on an adjoining tree, preferably of valueless species for identification. For example, if tree number 13 caused a gap which is artificially regenerated in 1954, the stem of an adjoining tree should be engraved |13|—54.

231. *Staking and soil preparation.*—Only the centre of the gap where there is most light is to be artificially regenerated; the periphery may be neglected. For general guidance an arbitrary distance of 5 yards from the foot of the line of trees on the edge of the gap is suggested as the width of the periphery which may be omitted from artificial regeneration.

232. No extensive clearance of slash is necessary; the aim should be to secure the utmost protection for the regeneration of keeping the branchwood as shelter from damage by Bison and other animals. Where game paths enter the gap, it is recommended that they may be obstructed by readjustment of the fallen branches, if this can be done without great expense.

233. An espacement of about 6 feet by 6 feet is prescribed for stocking. The spacing need not be absolutely uniform and may be altered slightly according to convenience. The object in not insisting on even spacing is to achieve economy in the clearance of the debris. The aim should be to get at least 25 stakes in such of the gaps as are taken up for artificial regeneration. All the stakes together need not form any geometrical shape so long as they are put in at an approximately correct spacing. Stakes should be 3 feet high above the ground and of durable wood. The soil at the stakes should be dug up to a depth of about 9 inches and over a foot square. The slash over each stake should be cleared just sufficiently to give the plants overhead light and freedom from drip.

234. *Sowing and planting.*—Experience elsewhere has been that dibbling gives as good results as planting stumps or seedlings : and hence mainly the seeds should be dibbled as being the cheapest method. Dibbling at the stakes should be done directly the seeds become available. Planting may also be tried, more especially in the unavoidable shortage of seeds which not infrequently happens with evergreen species which do not seed every year. Nurseries are therefore necessary for which details are given below. When essential, the nursery seedlings may be supplemented by seedlings from the natural forest if it is considered that their removal would not be harmful.

235. *Nursery.*—The nursery for raising seedlings for use in the evergreen forest should be formed in the same locality to permit the seedlings to get acclimatized. The site should be changed once in three years. A well drained locality with a deep soil should be selected and be freed of overhead shade and drip. The soil should be loosened for a depth of about nine inches and heaped up to about 18 inches depth in beds three feet wide and as long as may be convenient. Ample drainage should be provided between the beds which should be along contours on sloping ground. The beds should be supported on the sides by reeds or by branchwood to prevent wash. Fencing is advisable. During the hot weather the beds should be given overhead shade.

236. Heavy seeds such as those of *Dysoxylum malabaricum* should be dibbled about two inches apart and two inches deep in the soil, and light seeds should be sown and covered over with a thin layer of soil. After sowing, the beds should be covered with a thin layer of decomposed leaf mould to prevent exposure of the seeds. No watering is prescribed as the locality is moist, but the beds should be kept clear of weeds by frequent attention.

237. *Collection of seeds.*—The seeds should be collected from healthy middle-aged trees free from " twist." The time when the seeds begin to fall should be carefully watched and the first few seeds which fall on the ground should be swept away and discarded. Experience shows that the later falls are the most fertile of the seeds. Of the seeds collected the biggest and best grown seeds should be preferred.

238. It is estimated that approximately 400 gaps will have to be artificially regenerated in each coupe every year, and at about 25 patches per gap, sufficient seeds for 10,000 patches should be collected in addition to the quantity required for raising a stock nursery. The actual quantity of the various seeds required will depend on the availability of the seeds, but the order of importance of the species given in paragraph 228 should be borne in mind, aiming at a mixture as far as possible.

239. *Acrocarpus fraxinifolius.*—Seeds can be obtained from Palghat or from waterfall estate where it has been planted.

240. *Cedrela Toona.*—The seed can be obtained locally in a seed year. About 112,000 seeds go to the pound. It is preferable to collect the seeds of the tree just before the fruits open. The seeds are available by the beginning of May.

241. *Dysoxylum malabaricum.*—The fruits begin to ripe towards the end of June. The species can be found in the working circle, but more abundantly in the sholas sloping to Palakadavu north of the Anamalai estates. About 80 seeds go to the pound.

242. *Artocarpus hirsuta.*—This is not indigenous and it is recommended that fruits be obtained from similar localities in Palghat or from Palakadavu and tried experimentally.

The seed is perishable if removed from the fruit. Whole fruits should be obtained and not opened until the seed is required for sowing.

243. *Dipterocarpus Bourdilloni.*—The Provincial Sylviculturist is experimenting with this species, about the sylviculture of which little is known, and he should be consulted before attempting to sow it.

244. *Gluta travancorica.*—Seeds can be obtained from Tinnevelly division.

245. Heavy seeds like those of *Dysoxylum malabaricum* should be dibbled about two inches deep in the soil so that the cotyledons may remain within the soil after germination since it lessens the damage from vermin. Light seeds like those of *Cedrela Toona* should be covered with about a quarter inch of soil.

246. In all the gaps a mixture should be aimed at, so that, should one species fail in course of time, there will be others to survive, minimizing the risk of complete failure of regeneration in a gap.

247. Plenty of seeds should be dibbled at each stake; they should be evenly spaced in the worked patch of soil so that after germination there will not be crowding of the seedlings.

248. Casualties should be replaced during a break in the monsoon in the month of August. If at 25 per cent or more of the stakes there is no germination, the gap may be put down as one where the casualties require replacement.

249. *Casualties.*—For replacement of the casualties planting of seedlings or stumps may be resorted to, from the nursery or from the natural forest. Little is at present known about stump-planting of shola species, and the Provincial Sylviculturist must be consulted in the matter. In the second year before the outbreak of the monsoon casualties should be replaced by dibbling or by planting of stumps or seedlings.

250. *Weedings.*—Weedings in the first year should not take place till August or September at the earliest, and should then be done with judgment, taking great care not to disturb the root system. This operation may well be confined in the first year, to cutting back overhead cover and removing mechanical obstruction to growth. In February-March of the second year all the gaps should be examined and necessary weedings carried out. Due to lack of past work in this direction, very much is left to the discretion of the District Forest Officer. No weedings are prescribed after the second year: but the matter should receive careful examination and any necessary weeding or tending which may materially advance the growth of the seedlings must be done.

SECTION 7.—CONTROL.

251. For the prescriptions in this working circle the following control records are prescribed :—

(*a*) The control book for the timber fellings;

(*b*) the control journal;

(*c*) the regeneration ledger with large scale map and

(*d*) the record of works.

Forms for these records with suitable headings are furnished in Appendix V.

CHAPTER III.—WORKING PLAN FOR THE PLANTATION WORKING CIRCLE.

SECTION 1.—CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

252. The Old Punachi Working Circle is reconstituted as the Plantation Working Circle, and the boundaries are as indicated on the map which accompanies this plan.

253. The soil is a sandy loam, fairly rich in humus and is fertile. The depth of soil varies considerably and outcrops of the underlying gneiss are common in the higher slopes. Such outcrops of rock are however only over small areas, and over the greater part of the area, the soil sustains a fairly flourishing vegetation.

254. Primarily the growth is deciduous, but the undergrowth has a tendency to become evergreen wherever it is sheltered from fire or the canopy is sufficiently close. The tree growth consists of teak, *Dalbergia latifolia* (rosewood), *Pterocarpus marsupium* (vengai), *Anogeissus latifolia* (vekkali), *Terminalia chebula*, *Terminalia belerica* and *Grewia tiliæfolia*. Over a fourth of the area on the eastern extremity there is plentiful growth of *Shorea talura*. The height growth varies up to about 80 feet. On the older trees, damage from fires in the past is marked. Due to fires and exploitation in the past the stocking is generally open, and grass and lantana are abundant all over the area. There is an admixture of bamboo—mostly *Bambusa arundinacea*—along stream banks, and wherever the soil is deep. In the undergrowth the more abundant species are lantana, *Randia dumetorum*, *Helicteres isora*, *Clausena Willdenowii*, *Actinodaphne spp.*, *Litsœa* spp., *Mœsa indica*, etc.

SECTION 2.—BLOCKS, COMPARTMENTS AND COUPES.

255. The whole working circle of 2,612·6 acres has been divided into 20 compartments and stockmapped and described in the Punachi Working Plan (1925). Adjacent to the working circle, along the Torakadavu-Ar, additional areas can be found for inclusion in the working circle, if it is found advisable, after a sufficient trial has been given to the system prescribed below. This system is experimental and will be tried for a period of ten years for which prescriptions are now made.

256. It is necessary to establish plantations successfully on a definite system before it can be adopted for the locality for a whole rotation. A block of 225 acres—to be called *Periodic Block I*—which contain areas suitable for planting with teak and rosewood, has been selected for treatment for the next ten years, and coupes for felling and planting have been provisionally indicated on the maps accompanying this plan.

257. The rest of the area will be designated *Periodic Block II*. It has not been now subdivided into coupes for clear-felling and regeneration, as the necessity for this will arise only at the revision of the present plan.

SECTION 3.—ANALYSIS AND VALUATION OF THE CROP.

258. No enumeration of the timber stand has been made in either of the two periodic blocks.

259. The existing crop in Periodic Block I is inferior in quality, and is a remnant of the old selection fellings. It consists largely of *Anogeissus latifolia* and *Grewia tiliaefolia*, and is very open. Lantana is impenetrably thick over most of the area.

260. In Periodic Block II, the growth is also generally open but with a proportion of scattered mature trees of all species. Selection fellings have been made over some parts of the area in the past, and valuable trees which were considered likely to deteriorate, and which conveyed no benefit on the forest by their retention, have been exploited. The advantage of harvesting deteriorating and mature trees is considerable and consequently selection fellings are prescribed to be continued over this Periodic Block before the forest is ultimately taken up for clear-felling and planting.

SECTION 4.—METHOD OF WORKING.

(a) Operations in Periodic Block I.

261. It is not considered that it will be difficult to sell the standing growth in the small annual coupes which are contemplated for clear-felling for the next ten years. After enquiry the writer ascertained that a price of not less than Rs. 15 per acre might be expected for the standing growth to begin with, and that later on it should be possible to realize easily Rs. 30 per acre when the system gets established in the locality, and contractors realize the extent of the profit in the business. A statement of the fellings prescribed for the next ten years is given below: areas which are clearly unsuited for planting should be omitted at the discretion of the District Forest Officer.

Table of fellings.

Coupe number.	Compartment number.	Area in acres.	Year of clear-felling of timber.	Year of regeneration.
(1)	(2)	(3)	(4)	(5)
I	5	25	1935–36	1936–37. *
II	5	25	1936–37	1937–38.
III	5	25	1937–38	1938–39.
IV	8	27	1938–39	1939–40.
V	8	26	1939–40	1940–41.
VI	8	27	1940–41	1941–42.
VII	9	25	1941–42	1942–43.
VIII	9	25	1942–43	1943–44.
IX	9	25	1943–44	1944–45.
X	5	25	1944–45	1945–46.

* REMARKS.—There are a few established sandal seedlings in a corner of the coupe.

262. *Rotation.*—It is not possible, at present, to fix the rotation for teak grown in this locality. In the writer's opinion it will take *100* years to produce teak 6 feet in girth at breast height.

263. *Sylvicultural system.*—The aim is to replace the present degraded crop in as inexpensive a manner as possible by an even aged high forest of mixed valuable timber species. The more open and accessible areas have been taken up for treatment in the next ten years. The locality is close to the Pulayar settlement of Punachi and with effective supervision, it is believed to be possible to organize and guide the Pulayars successfully to grow a crop of timber trees along with field crops. Accordingly, it is prescribed that planting operations shall be carried out with the help of field crops.

264. The general principles of the method of treatment will be those prescribed by the Chief Conservator in his Proceedings No. 321, Press, dated 12th October 1927, namely, " In all questions of regeneration with the help of agriculture it is to be remembered that all the department can expect is that cultivators will bear the expense of the final clearing up and burning, that if the introduction of the tree crop is left to them it will not be done and that if the jungle man is harassed and forced to work without payment he will not co-operate. . . . There should be no payment made for clearing and burning and the forestry work should be carried out by the department."

265. Accordingly all forestry work will be paid for, the cultivator being given the option of supplying the labour for the purpose at the usual rates prevalent in the locality. This will give the cultivator the financial assistance he needs, while he is waiting for his crops to ripen. Until they get used to the system, which is new to them, the local Pulayars may have to be paid something also, for clearing and burning.

266. *Exploitation and yield.*—The coupe proposed for regeneration 16 months later, shall be surveyed and demarcated in December by a cleared line 8 feet wide, and the prominent corners indicated by cairns. The right to clear-fell and remove all standing growth over the coupe from January to the following December shall be sold and the coupe conveyed to the purchaser before the beginning of January. The contractor shall not be allowed to remove branchwood below 12 inches in girth, the object being only to make such revenue as may be possible out of the growth prior to the cutting and the burning to follow. The contractor shall fell trees as near to ground level as is practicable, and the fellings shall be regulated by the ordinary rules and regulations applicable to clear-felling coupes. The contractor shall be bound to keep a depot for brake poles at Attikatti and sell them to cartmen at 3 annas per pole. No extension of voidah beyond December shall be ordinarily allowed as it will interfere with the subsequent regeneration operations.

267. *Allotment of land for " Podu " cultivation.*—During the month of January, the coupe quitted by the contractor shall be parcelled out for cultivation among the local resident Pulayars of Punachi. If land is surplus to their requirements, the District Forest Officer shall have the discretion of permitting the allotment of land to Kaders and Muduvars or other forest tribes, who may want the land, or to people from the plains. The allotment of land shall be free of assessment but the assignment shall be on the terms embodied in an agreement a sample of which is given in Appendix III. The agreement form embodies the terms usual for such assignments of land in Travancore and in the Wynaad : the District Forest Officer is not bound to use this form if he can devise a better one serving the object sought to be attained.

268. The Pulayars and Muduvars are familiar with the practice of Podu cultivation. They have done it for years, and know exactly what is required. The standing growth is cleared towards the end of January, and burning and reburning is completed before the end of Mach. The clearing and the burning should be controlled and conducted as thoroughly as possible. Care must be taken to see that the fire does not escape into the surrounding forest, and the usual practice of clearing lines all round the felled coupe, and of sweeping the litter in a safety belt a few feet further into the surrounding forest should be continued.

269. The cultivators must be made to uproot the lantana thoroughly as soon as the ground has become sufficiently soft, and if this is done properly, the regrowth of this weed should not be serious, and it should be possible to eradicate it entirely during the subsequent weeding operations in the field crop after the rains.

270. In the event of an unforeseen failure of the system of Podu cultivation in these forests, the clearing, burning and planting shall be done departmentally.

Further, should the system of making the contractor maintain a brake pole depot not prove a success, the District Forest Officer shall revert to the present system and sell the brake poles departmentally. It is considered advisable that the contractor should be responsible for this supply in view of the fact that an appreciable revenue may be derived from it and this will serve as an outlet for a part of the otherwise unsaleable material in his coupe. Extraction of brake poles will, under this system, be from a single coupe annually, instead of, from anywhere in the forest as is the case at present.

271. *Regeneration—Choice of species.*—The valuable species that are indigenous to the locality, are teak, *Dalbergia latifolia* (rosewood), and *Pterocarpus marsupium* (vengai). These species have been extracted in selection fellings in the recent past and have been sold at fair prices without difficulty. Moreover, teak raised in this locality in the recent past has grown fairly well.

It is therefore prescribed that these three species be used for the plantations. Though *Artocarpus hirsuta* (ainee) is not indigenous, the elevation, rainfall and ecological factors indicate that it should thrive in the locality. Consequently, it is also prescribed that experimentally over an area of about one acre a year for three successive years *Artocarpus hirsuta* be planted in mixture with teak. If the results are satisfactory, the planting will be continued; otherwise it will be discontinued.

272. *Coupe map.*—A coupe map on a scale of 16 inches to the mile must be prepared after the clearing and the burning, and the map must show the prominent features of the coupe, allotment to cultivators, roads, paths, etc. A copy of this map should be filed with the regeneration ledger.

273. *Alignment and staking.*—After the clearing and burning, guide lines for correct alignment should be laid out with a compass, preferably at right angles to the road, or main path, in order to facilitate inspections. The alignment should be done with care. Stakes about 2 feet 6 inches long should be driven into the ground at an espacement of 6 feet by 6 feet: they should be sufficiently strong to last the season. This spacing is recommended as a compromise considering that close spacing is essential for early closure of the canopy in order to suppress lantana and other weed growth, and too close a spacing is prejudicial to the interests of the cultivator who must have sufficient space to grow his crops. This spacing has been found to be satisfactory in the Wynaad for similar plantations.

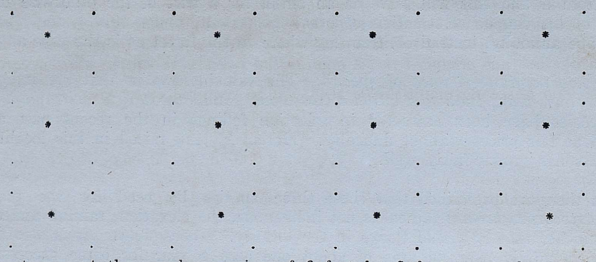
In view of the fact, however, that, owing to the menace from lantana, it is of paramount importance that the canopy should close as early as possible, an experiment will be made of planting 3 feet by 3 feet in one acre in each of the first two years and the results watched. It is probable that this planting will have to be done departmentally as the espacement is too close for field crops to thrive. The Provincial Silviculturist should be consulted on this matter as he is in touch with a similar experiment that is being made in the Wynaad.

274. Sites for the erection of huts by the cultivators may be allowed to be erected after staking. Such sites should, as far as possible, be located outside the coupe, and in any case they should not exceed one for every two acres. The sites should not exceed 24 feet by 24 feet, and the huts should as far as possible be allowed to be erected only on shallow soils.

275. *Soil preparation.*—No soil preparation is necessary: stumps are to be planted in crowbar holes, special care being taken to see that the soil is pressed tightly against the tip of the root. The Provincial Silviculturist should be consulted periodically as to the latest developments in connexion with stump planting.

276. *Distribution of the species.*—The distribution of the species will be decided by the District Forest Officer at his inspection of the coupe immediately after the clearing and burning is complete. The main species to be planted is teak, and this will be done over the whole area, as it only, is likely to be able to keep the lantana in check. *Dalbergia latifolia* and *Pterocarpus marsupium* may be introduced either by planting stumps in quincunx in between alternate rows of teak, or by dibbling seed in prepared patches close to the teak stumps, or by whatever method the District Forest Officer may consider likely to be successful. In this connexion it should be borne in mind that successful regeneration of rosewood has, in the past, been obtained from root

shoots. The suggested arrangement of subsidiary species in quincunx in between alternate rows of teak is illustrated below, the dots representing the teak at an espacement of 6 feet by 6 feet and the crosses the subsidiary species at an espacement of 12 feet by 12 feet :—



The teak stumps at the regular spacing of 6 feet by 6 feet are to be put in with a view to the early closure of the canopy and the eventual suppression of the lantana and the weeds. In due course, by judicious thinnings, a mixture of teak with other species will be obtained.

277. As an experiment, it is prescribed that over one acre a year, for three successive years, in moist situations, if possible, *Artocarpus hirsuta* (ainee) be planted alternately with the teak in each row. If the results are satisfactory the mixture should be continued in suitable places in subsequent years. The Provincial Silviculturist should be consulted as to whether stumps or transplants should be used for this purpose.

278. Other species in mixture with the teak will be obtained naturally from the adjoining seed bearers in the forest. The extent to which *Dalbergia latifolia* and *Pterocarpus marsupium* are to be used will be left to the discretion of the District Forest Officer.

279. *Method of planting.*—Both the teak and *Dalbergia latifolia* will be planted as one or two year old stumps. *Pterocarpus marsupium* will usually be dibbled, but it may also be planted out as stumps, should the Provincial Silviculturist's experiments show that this is advisable. As regards *Artocarpus hirsuta*, as stated above, the Provincial Silviculturist is to be consulted.

280. *Nursery.*—The nursery site should be selected on well-drained fertile soil, preferably close to the Ali-Ar river. It should be cleared of all growth, the soil dug up to a depth of one foot, all roots and stumps removed, and the area protected by a fence. Beds four feet wide with paths $1\frac{1}{2}$ feet wide between them should be formed, the length of the beds being a matter of convenience. About 15 inches depth of loosened soil should be provided for in the nursery beds, and the sides supported by split bamboos. The surface of the beds should have a slight camber to prevent accumulation of water.

281. The following instructions issued by the Provincial Silviculturist represent the latest and most successful practice in raising teak stumps and should be followed :—

Approximately 30,000 one-year old teak stumps will be required every year for planting an area of about 25 acres, assuming that teak is planted at every stake 6 feet by 6 feet. "*Twenty beds 40 feet long by 4 feet wide will be required to produce this number of stumps, but to ensure against incomplete stocking it is better to have 30 beds 40 feet long by 4 feet wide. Teak seed should be sown in them not later than about the end of April with seeds almost touching, i.e., approximately half an inch apart on the average. This requires about 1 to $1\frac{1}{4}$ bags of seed per bed of 40 feet by 4 feet. Germination is hastened by covering the beds with straw laid on twigs* (Phyllanthus emblica *twigs have been found most suitable) and watering through the straw. The straw should be removed as soon as the germination has commenced. Watering will have to be done until the rains set in. The pricking out of seedlings into other beds is not recommended unless there is a shortage of seed. It is expensive and gives less satisfactory results than raising the plants direct from seed without transplanting. If desired, a certain amount of thinning out may be done in the beds to about 3 inches espacement but this also is not really necessary. If on the other hand the beds are left unthinned there will be a number of suppressed plants left behind which will grow into suitable stumps as a reserve for the next year's work. Superfluous beds if any, can be retained for*

use when the plants are two years old, but it may be advisable to use the largest plants in them when twelve months old. As far as is known there is no disadvantage in using large two-year old stumps over an inch in diameter, but the Provincial Silviculturist should be consulted from time to time on this point, and upon the best method of nursery work. The aim should be to produce stumps not less than three-eighth inch diameter at the thickest part (the larger the better) at a reasonable cost. If it is found that stumps of this size are not produced in 12 months the nursery should be started earlier."

282. The following quantities of seed will be required every year :—

For raising in nurseries.

Teak	... ...	2,000 lb. or 33 bags.
Artocarpus hirsuta	... ...	25 lb. or ½ bag.
Dalbergia latifolia	... ...	25 lb. or 1 bag of pods.

For dibbling direct.

Pterocarpus marsupium	...	30 lb. or about 1 bag.

The seeds required can be obtained locally, except *Artocarpus hirsuta*, which can be obtained from Palacadavu in this division.

283. *Collection of seeds.*—Seed must be obtained from healthy vigorously growing trees, and must be carefully selected. Only healthy seeds should be used, and all others should be discarded.

284. *Preparation of stumps.*—When the planting is to commence it is suggested that the seedlings should be pulled up after moistening the soil and loosening it with a pointed stick, and not dug out. The reason for this is that only the best developed stumps need thus be used, and, if the earth is firmed up round what are left, they continue to grow, and can be used later in the same year or even in the second year for the next year's plantation. This is now the practice in the Wynaad and there is no difference to be seen between the growth of first and second year stumps of the same size. Only as many stumps as can be planted out the same day should be taken from the nursery. The stems should be cut with a sharp knife leaving one inch above the collum, and the root pruned about 9 inches below the collum. All lateral roots must be cut off. The stumps should be kept shaded and must be transported to the planting area with care.

285. Experimentally, if there are sufficient of them, stumps may be brought from Mount Stuart, where large nurseries are made annually; it has been found by experiment that teak stumps do not deteriorate, either in percentage of survival or vigour of growth, if kept for a period of up to one week; if this be found to be successful there will be no need to prepare the nurseries at Punachi described above.

286. *Planting.*—In the past the usual time for planting out stumps has been in the middle of June after the rains have set in. Experiments recently conducted, however, indicate that early planting of stumps gives better results than planting in June. The early planting has the advantage that the teak has the time to develop a root system before the ground gets water-logged during the heavy rains. Hence early planting is prescribed. About six to eight inches of rain in April-May is found to be adequate to make the soil sufficiently moist, and the planting of stumps should be done early in May, or even in April, if there have been some good showers. That many days in May are rainy, is all to the advantage of this early planting.

287. The planting will be done in crowbar holes unless it is found that, in this comparatively dry locality, pits, in which the soil has been worked up, give definitely better results. Both methods should be tried. Experiments made over fairly wide areas have shown, so far, that the slightly faster growth of the stumps planted in pits is not sufficient to warrant the extra expense involved.

Great care must be taken to see that the stumps are planted with earth tight round the tip. The planting coolie should test each stump to see that it is gripped at the tip before he closes the earth in round the upper part of the stump, and the subordinate supervising the work should test the work of each coolie here and there by digging away the soil from the upper part of a few stumps to a depth of about 5 inches and feeling whether the stump is firmly gripped by the soil round the tip. The reason for doing this is that the initial roots spring, in a large percentage of cases, from the last quarter of an inch of the stump, and immediate contact with the soil facilitates early establishment. A cavity round the tip of the stump also tends to induce rot.

Stump planting of rosewood will be done in a similar manner.

288. Dibbling of *Dalbergia* and *Pterocarpus marsupium* should be made after wounding the soil lightly, and the seeds should be covered over with a layer of soil.

289. *Replacement of casualties.*—Casualties should be replaced as soon as they are observed in the first growing season.

290. *Weeding and tending.*—During the year of formation weeding should be done as often as the field crop is weeded, by the cultivator, who should keep a radius of one foot free of all growth around each teak plant and each *Artocarpus hirsuta* but who need not weed around *Dalbergia latifolia* and *Pterocarpus marsupium.* According to this practice there will be (*a*) a thorough removal of all weeds from the crop just before the commencement of the heavy rains in June, (*b*) a weeding early in August with the cessation of the south-west monsoon, and (*c*) a weeding towards the end of August. In addition to this, at the time the crop is harvested, the cultivator shall be required to pull out all the weeds and crop within a radius of 18 inches around each plant, shake the soil back into its place from the roots, and lay the weeds along the contour to prevent the soil being washed down by the rains. If the District Forest Officer finds further weeding is necessary he should take steps to have it done departmentally, and should consider the desirability of a " scraping."

291. *Second year weeding.*—During the second year a thorough weeding and soil forking or scraping should be done well before the monsoon, in May. The Provincial Silviculturist should be consulted as to which is advisable; he is now conducting experiments and should have definite results available shortly. At present carefully controlled experiments, repeated twice *indicate* that scraping is very nearly as effective as forking and is only about half as expensive. The rains late in April mark the commencement of considerable growth activity in plants and the aim should be to make the best of this activity. Hence it is prescribed that weeding be done in the first week of May directly after a few heavy showers. Along with this weeding, all forked plants and those with large lateral branches must be carefully pruned. Damaged plants should be cut back flush with the ground. *Natural regeneration of other timber species must be retained.* It is only to be removed under the District Forest Officer's orders in cases in which it is doing considerable harm to the planted species, and in such cases it should be coppiced.

292. *Third and fourth year weeding.*—Weeding in these years will be left to the discretion of the District Forest Officer. Very little, it is expected, will be necessary.

293. *Thinnings.*—It is suggested that a cleaning and thinning be done in the fifth year, and the District Forest Officer should do a part of the operation himself at least in the first coupe. The thinnings should aim at obtaining a mixed crop of trees of large girth rather than great height, and they should be made in accordance with the principles laid down in the Forest Pocket Book.

294. *Cost of planting operations.*—The coolie rate in the locality is only 6 annas for men, and is less for women and children. Nevertheless to be on the safe side the estimated costs may be based on the actuals in the Wynaad Division for 1933, and should be approximately as follows :—

	RS.	A.	P.
First year—			
Felling and burning ...	Free.		
Nursery charges ...	4	5	0
Alignment and staking ...	2	6	0
Planting ...	3	3	0
Weeding ...	Free.		
Second year—			
Weeding, pruning and soil forking, say ...	9	0	0
Total ...	18	14	0

But it may well be found that, with close supervision, these costs can be reduced.

(b) Operations in Periodic Block II.

295. *Selection fellings* on the following lines are prescribed for this periodic block. The compartments are very unevenly stocked and the yield will no doubt vary if definite areas are worked over every year. This will however cause little inconvenience in view of the fact that the yield from these fellings will form only a very small part of the total volume of timber brought to the local markets from this forest division. It is therefore prescribed that one compartment be exploited annually.

296. *Marking for felling.*—In undertaking the marking, the following sequence of the compartments shall be followed. Compartment 12 has been marked for felling in 1934–35, and from the year 1935–36 marking shall be continued in the compartments 10, 13, 15, 16, 17, 18, 19, 20, 1 and 2. The marking shall be undertaken in regular order from one end of each compartment to the other.

297. The marking shall be done in November-December when trees are yet in leaf, by an officer not lower in rank than a Ranger, and the District Forest Officer must take steps to ensure that the marking is adequately checked by a gazetted officer before the felling is sanctioned from the succeeding April. The following marking rules shall be observed :—

(*a*) Only teak, *Dalbergia latifolia* (rosewood), and *Pterocarpus marsupium* (vengai), shall be marked for extraction, provided such trees are saleable at a reasonable profit.

(*b*) No tree shall be marked if there is any silvicultural objection to its removal,—such as the creation of an undue opening in the canopy which is unlikely to close up within a short time.

(*c*) No sound trees of less than 6 feet girth at breast height shall be marked for felling. But dead or unsound smaller trees, firescarred or otherwise, unlikely to grow to mature size may be marked if their extraction is remunerative.

(*d*) The trees marked for felling should have numbers etched on them in two positions so that after felling the stump as well as the tree may be identified.

(*e*) All climbers in the compartment should be cut effectively at the time of marking, so that when the felling takes place, the damage to neighbouring trees may be minimized.

(*f*) At the time of marking, the surface roots of all rosewood marked for felling shall be wounded in two concentric circles at about 10 and 20 feet radius from the stump, in order to induce root-sucker regeneration.

(*g*) The marking officer should measure the girth of the trees at breast height (4 feet 6 inches) on the uphill side if on sloping ground, and estimate the bole height, and the cubic contents of the timber expected from the tree.

298. *Felling and extraction.*—It is suggested that the trees be sold standing, in April, allowing the contractors to fell, and do the conversion themselves under departmental supervision within a period of one year. In the event of contractors failing to undertake the work and pay a proper price, the felling and dragging to roadside depots shall be done departmentally, as hitherto, during the months July to December. In this case the marking will have to be revised so that only such trees are extracted as will be saleable at a reasonable profit. It will be left to the District Forest Officer to determine the most advantageous manner of disposal of the produce.

299. *Regeneration.*—In the year following the felling operations, the felled area shall be examined again for carrying out tending operations to such of the young saplings and seedlings as appear suppressed or damaged. Such tending operations shall include—

(*a*) the freeing of regeneration by weeding and cleaning, and of promising stems (not irretrievably suppressed) of the valuable species whose proper development is being (or is imminently likely to be) hindered by other species, the latter being felled if economically exploitable (such as for brake poles), or being girdled if not utilizable at a profit ; and

(*b*) the cutting back of badly grown or damaged teak, rosewood, or vengai.

The cost of this tending is estimated at about Rs. 50 per year.

300. As an experimental measure, it is prescribed, that in six of the more open gaps created by the selection fellings, regeneration be undertaken on the following system :—

A belt 3 feet wide all round the edge of the gap will be hoed up 6 inches deep and seeds of *Tephrosia candida* broadcast in it fairly thickly early in the month of May. Teak stumps should be planted in the centre of the gap in the usual way right up to, but not actually in the *Tephrosia* belt. The *Tephrosia* will probably require some weeding in the first year until it is well established. The idea is to see whether a belt of *Tephrosia* round the edge of a gap will prevent or at any rate diminish the invasion of lantana and other climbers into the gap for several years so as to enable the teak to get well ahead. The record will be kept in an experimental plot register of how the *Tephrosia* thrives, the height it attains at the end of the first monsoon, and thereafter in the hot weather each year, and whether it is fulfilling its function of keeping out invasive weeds. Suitable experimental plot forms can be obtained from the Provincial Silviculturist. A report on the experiment should be communicated to him annually not later than May.

301. The experiment shall be conducted for three years in the first instance. Details may be varied from year to year on consulting the Provincial Silviculturist in accordance with experience gained, and the continuance of the experiment after three years, shall be decided on the results achieved.

SECTION 5.—OTHER REGULATIONS.

302. *Old regeneration areas.*—Prior to the Punachi Working Plan (1925), plantations have been raised as indicated in paragraph 141, and these plantations have to be thinned. Under the prescriptions of the Punachi Working Plan (1925) the following areas have been regenerated and it will be left to the discretion of the District Forest Officer to carry out such tending or girdling operations as may be necessary. The following tabular statement is given for guidance: the annual cost of such thinning or tending is estimated not to exceed Rs. 100 and no revenue is anticipated from the operations :—

Serial number.	Year of planting or regeneration.	Compartment number.	Area in acres.	Species.	Cost of raising and tending till the end of 1933–34.	Year when thinning or tending is recommended.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					RS. A. P.		
1	1922–23 ..	14 d	3·6	Teak ..	241 0 0	1935–36 and 1941–42.	
2	1923–24 ..	14 c	13·8	Do. ..	473 4 0		
3	1924 ..	14 b	23·8	Do. ..	438 15 0		
4	1925 ..	14 a	26·5	Do. ..	238 11 0		
5	1926 ..	3	19·0	Teak and rosewood.	471 7 6	1936–37 and 1942–43.	
6	1927 ..	3	25·0	Do.	424 0 3		The tending of the crop should be made only after the inspection by the District Forest Officer and in places where the expenditure would be justifiable by results.
7	1928 ..	3	17·3	Do.	427 7 0		
8	1929 ..	3	20·4	Do.	300 2 0	1937–38 and 1943–44.	
9	1930 ..	3	42·2	Do.	446 8 6		
10	1931 ..	4	36·0	Teak and vengai.	460 11 6	1938–39 and 1944–45.	
11	1932 ..	6 a	38·7	Do.	313 5 0		
12	1933 ..	6 a	27·1	Do.	365 3 0	1939–40 and 1945–46.	
13	1934 ..	6 a	24·0	Do.	201 0 0		

NOTE.—The expenditure in column (6) does not include that estimated for expenditure during the year 1934–35.

303. *Grazing.*—The forest shall remain closed to grazing as at present, that is to say, all compartments shall remain closed to grazing except compartment 1 which will be open to 30 heads of cattle of the resident population of Attikatti at a special grazing fee of Rs. 2–8–0 per head of cattle.

304. *Fire-protection.*—The present method of fire-protection will be continued. Early burning, the only other alternative, tends to increase the growth of lantana and grass: and, as it is our aim to suppress both, regular fire-protection (by means of fire lines) is necessary. Fire-protection has a tendency to increase the evergreen undergrowth, an effect which should ultimately kill out the growth of grass and lantana.

305. For efficient fire-protection, the following lines shall be maintained :—

Fire lines. (1)	Approximate length. (2) M.	F.	Estimated annual cost. (3) RS.
(i) An external line, of width 50 feet along the working circle boundary where such is neither the Torakadavu Ar nor the Public Works Department road, nor the rest-house compound	8	7	90
(ii) Internal lines of 15 feet width—			
(*a*) Between compartments 2 and 3	0	4	3
(*b*) Around compartment 6 (*a* and *b*)	1	0	5
(*c*) Around compartment 14 (*a*, *b*, *c* and *d*)	1	1	6
(*d*) Along the compartment boundaries of 7 and 13 on the one side and 8 and 13 on the other, from compartment 6 in the west to the Ali Ar road on the east	0	6	4
(*e*) Between compartments 9 and 10	0	3	2
(*f*) Between compartments 11 and 12, east of the 4th milestone of the road to the Ithakulipallam	0	4	3
(*g*) Between compartments 16 and 17	1	2	7
(*h*) Between compartments 18 and 19	1	0	5
(iii) Around recognized halting places for cartment on the Ali-Ar and the Public Works Department road	Lump sum.		5
Total ..	15	3	130

306. The exterior fire line shall be made by burning between cut guide lines under control annually in the months of February-March; the cost is estimated at Rs. 10 per mile. The interior lines need not have guide lines, but the weed growth on them shall be cut and burnt with care in February-March: the cost of burning such lines is estimated at Rs. 5 per mile. The total cost as estimated above is expected to be not more than Rs. 130 per year.

307. *Livestock.*—Departmental extraction of timber is not primarily contemplated. In the event of failure of the attempt to sell trees standing, there will be work for about two elephants for a period of six months.

308. *Compartment boundaries.*—Compartment lines as indicated on the map shall be maintained as cleared pathways. Planted areas shall be demarcated by coupe stones, the year of regeneration being engraved on them. Boards indicating compartment numbers in the working circle shall be maintained.

309. *Roads and buildings.*—Existing roads and buildings are adequate and they shall be maintained in good condition.

310. *Control.*—For the operations prescribed in this working circle, the following control records should be maintained :—

(*a*) The control book for the fellings,

(*b*) the control journal,

(*c*) the regeneration ledger with large scale map, and

(*d*) the record of works.

Forms of these records with suitable headings are given in Appendix V.

CHAPTER IV.—WORKING PLAN FOR THE FUEL WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

311. The Fuel Working Circle is formed in the most accessible and most easily workable portions of the forests on the outer slopes of the hills. It includes practically the whole margin of the forest along the reserve boundary capable of being worked for fuel. The working circle has an area of 20,200 acres and its distribution among the ranges and subdivision into felling series is indicated in the following statement :—

Statement of Fuel Felling Series in South Coimbatore Forest Division.

Serial number.	Range.	Name of felling series.	Area of felling series in acres.	Rotation.	Area of normal annual coupe in acres.
(1)	(2)	(3)	(4)	(5)	(6)
1	Pollachi	Pothamadai	959	30 years	32
2	Do.	Keerapadi	570	Do.	19
3	Do.	Gudaravalli	986	Do.	36
4	Do.	Ayerangal	1,175	Do.	39
5	Do.	Pachathanni	1,049	Do.	35
6	Do.	Kottur	1,905	40 years	48
7	Do.	Nal-Ar	1,221	Do.	31
8	Udamalpet	Dhali	2,764	Do.	69
9	Do.	Kamanuthu	3,461	Do.	87
10	Do.	Chinn-Ar	3,085	Do.	77
11	Do.	Amaravati	2,522	Do.	63
12	Do.	Naval-Odai	1,403	Do.	35

312. The working circle lies entirely in the Pollachi and Udamalpet ranges which two alone adjoin villages. The existing fuel supply from the Government forests meets but a moiety of the demand from the villages: private forests and patta lands meet the rest. All areas which would permit of the economic extraction and transport of fuel to centres of consumption have been included in this working circle. Further extension is only possible into the remoter valleys and hills beyond: the cost of extraction and transport from such areas prohibits the consideration of fuel working at present from such localities.

313. *Character of the vegetation.*—The vegetation in this working circle is generally of the mixed deciduous type. The height growth is poor, the trees ill-grown and the stocking very open. The soil is generally a sandy loam, stony, shallow except along

stream banks, and poor in humus content. Variations in rainfall also exist: in this respect the area can be divided into two distinct zones. Of the felling series named in paragraph 311 the first five, situated around Sethumadai, receive an annual rainfall of about 40 inches in the year, while the rest receive only about 25 inches in the year. These factors have a marked influence on the vegetation in these localities.

314. A noteworthy feature is that in proportion as the locality is remote from the margin of cultivation, the quality of the growth improves from the open scrub jungle to the poor quality timber forest. The outskirts of the reserves in the zone of low rainfall have a vegetation of open scrub jungle of the poorest quality consisting mainly of thorny species grown from coppice. The species commonly found in such forests are *Acacia leucophlœa*, *Acacia arabica*, *Acacia latronum*, *Acacia ferruginea*, *Dichrostachys cineria*, *Carissa carandas*, *Zizyphus* spp., *Cleistanthus collinus*, *Albizzia amara*, *Azadirachta indica*, *Sapindus emarginatus*, *Tamarindus indica*, *Gmelina asiatica*, *Gyrocarpus jacquini*, *Balsamodendron berryi*, *Protium candatum*, *Dolichandrone* spp., etc. Woodgrowth is moderate or poor, lantana is absent, but grass exists to varying degrees of intensity. Further into the interior in the same zone the growth improves and trees of about 25 feet in height are common: species such as *Anogeissus latifolia*, *Hardwickia binata*, teak and *Pterocarpus marsupium* are found in addition to the above species. In such forests bamboos occur in a thin belt along the streams. In the zone with the higher rainfall, the vegetation is a heterogeneous mixture of all deciduous species, heights of 40 to 50 feet are common in the trees, and bamboos are more abundant. Weed growth is thick in such forests, creepers such as *Pterolobium indicum* and *Acacia intsia* thrive, and lantana is very dense.

315. Natural regeneration from seed is generally defective: but in proportion to the shelter afforded by thickets of brambles and bushes, groups of seedlings are found within them wherever the soil is soft enough to serve as a germinating bed for the seeds. Coppice regeneration is generally good: coppice shoots manage to survive the pressure of invading lantana or grass, and even damage by occasional ground fires.

SECTION 2.—METHOD OF TREATMENT.

316. *Silvicultural system.*—The forests will be worked under the 'simple coppice' system: tamarind trees, however, being reserved in view of their value as fruit trees. Natural coppice will be supplemented by artificial "rab" regeneration in strips where the slash resulting from fellings has been burnt.

317. *Rotation.*—It is not possible to calculate the economic rotation from considerations of maximum yield of fuel because data are not available for any such determination. Measurements of girth of coppice shoots in coupes of known ages have been made, but in a mixed forest of very heterogeneous composition with a considerable percentage of species unfit for fuel, the application of growth data for determination of rotation would be inaccurate and misleading. The rotation has therefore to be fixed arbitrarily for the present. The soil and rainfall, factors which influence the crop considerably, vary over the working circle, and hence a uniform rotation for all series is not indicated. From an inspection of the locality it is noticed that two distinct quality classes, based on annual rainfall, exist within the working circle, and hence a rotation of 30 years for the I quality and 40 years for the II quality is prescribed. The rotation to be adopted for each felling series is indicated in the statement in paragraph 311.

318. Lack of homogeneity in the quality class in the same felling series doubtless exists, noticeably in Keerapadi and Villoni felling series, but it is not practicable to take into account minor differences of the kind. The aim during the first rotation will be to work over the whole area. At the revision changes in the rotation or alterations in the constitution of the working circle will be considered.

319. From the rate of growth of coppice shoots in old fuel coupes, it appears that in a period of 40 years in the II quality fuel forests, important fuel species such as *Albizzia lebbek*, *Acacia leucophlœa*, etc., may grow to a breast height girth of about 20 inches, a size readily adapted for billetting and splitting. Some small timber as poles for house construction, or agricultural implements is obtained and converted from the fuel coupes and the rotation adopted is conducive to the maintenance of a sufficiency of such produce. It should however, be borne in mind that, as ample timber is available from other parts of the division, the production of timber is not a primary object of management of this working circle.

320. *Regulation of working.*—It is impracticable to regulate the working with respect to an equal annual output of fuel because of the variation in the density of stocking. Working will therefore be regulated by area, the area of the annual coupe, corresponding to the total area of the felling series divided by the rotation. The area of the average annual coupe is indicated in the statement in paragraph 311.

321. *Method of executing fellings.*—Each felling series will have an annual coupe, as nearly equal as possible to the average annual coupe. The coupes for all the felling series for the whole rotation have been indicated in the working plan maps. In actually demarcating the coupes, small deviations in areas are inevitable and the fact will not constitute a deviation from the sanctioned working plan. The coupes have been serially numbered and the sequence should be maintained in actual working: they have not been definitely allotted to years. If a coupe of any series cannot be worked in any year, an effort should be made to work it in the succeeding year in addition to the prescribed coupe of the year. Likewise, arrears of coupes partially worked in any year should be worked, if possible, with the succeeding year's coupe, mention of the fact being made in the control journal.

SECTION 3.—EXPLOITATION.

322. *Agency of felling.*—The fellings in this working circle shall continue to be through the agency of contractors.

323. *Indicator areas* to determine the yield of fuel and other produce from each annual coupe need not be felled. The outturn from past working in most localities is sufficiently accurately known to determine the value of the coupe prior to sale. Before any coupe is put up for sale, the District Forest Officer shall himself decide, whether and if so, where indicator areas are to be felled. When they are considered necessary the area to be felled for the purpose should be demarcated and the contractor should be required to fell and stack the fuel on this area before the rest of the strip is cut, and as soon as it is ready the fuel and timber obtained from it should be measured up by the Range Officer, after which the contractor may remove it.

324. *Coupes.*—Coupes for working from the succeeding April shall be surveyed and demarcated in the month of January, by a cleared line 10 feet wide all round the coupe, and the correct area computed. The coupe should be subdivided by cut lines about 4 feet wide into a convenient number of strips (not more than four) discretion being given to the District Forest Officer to orientate the strips suitably. In forming the strips care should be taken to see that the coupe is halved approximately so that the burning and regeneration operations prescribed below may be undertaken in one half conveniently whilst yet the second half is under felling.

325. *Maps.*—A diagrammatic sketch of the coupe on any convenient scale, showing roughly the lay out and number of the rab lines shall be maintained for guidance in the field work. A copy of this shall be filed with the regeneration ledger for the coupe.

326. *Leases.*—The right to clearfell and remove all growth in the coupe should be sold in public auction, and the coupe delivered to the purchaser before 1st April. The contractor will be bound to complete the clear-felling of the coupe within a period of twelve months: but it will be incumbent on him to complete and deliver back half of the coupe before the end of August so that regeneration work may be carried out conveniently on it during the north-east monsoon.

327. *Felling rules.*—The contractor shall abide by the following rules:—

(*a*) Felling should proceed systematically in one strip at a time. The contractor should not be allowed to commence any fellings in a strip before his work in the previous strip has been inspected and passed by the Range Officer.

(*b*) If an indicator area is decided upon, the contractor must fell it and stack the produce before cutting the rest of the strip; he must not remove any of the produce from it till it has been measured by the Range Officer.

(*c*) All growth except tamarind should be cut as nearly flush with the ground as possible.

(*d*) Trimming of the cut stumps should not be insisted upon; but sharp implements must be used in cutting. The cut face must be clean and the bark should not be separated from the stem of the stump. Coppicing and felling should be done at the same time.

(*e*) All thorny shrubs and climbers such as *Pterolobium indicum*, *Acacia intsia*, *Acacia pennata*, etc., should be cut back to ground level.

(*f*) Exceptions to the above rules will be allowed in the case of species of no utility which have to be exterminated from the fuel coupes. Such species are *Gyrocarpus jacquini*, *Balsomodendron berryi*, *Protium caudatum*, *Euphorbias*, *Moringa pterygosperma and Dalbergia paniculata*. These may be felled at a height not exceeding 2 feet from the ground; the stumps should be hacked and the bark removed from the stump.

(*g*) Trees yielding timber, or pieces sawn or otherwise converted from the coupe shall be left at the stump site and each item converted shall be identified and hammer marked by the Range Officer with the pass hammer mark before removal from the coupe.

(*h*) The firewood shall be billetted and stacked prior to removal. No removal of firewood in cartloads shall be permitted without prior billetting and stacking. The stacks should be of the dimensions 5′ × 4′ × 3′ = 60 cubic feet or some measurement which shall be maintained uniform for a whole coupe.

(*i*) Firewood from branches and brushwood less than 12 inches in girth, and bamboos, may be removed in headloads without previous billetting and stacking: but for such removals the special permission of the District Forest Officer shall be obtained. Such permission may be refused or restricted if an absence of sufficient brushwood for obtaining a burn in the coupe is feared.

(*j*) All brushwood and material not required by the contractor, or prohibited from removal, should be heaped by the contractor in an orderly and compact manner for subsequent burning. The heaps should be in interrupted lines about 9 feet in width and approximately at intervals of 40 feet. The actual interval between lines will depend on the amount of slash available. The lines should start at the coupe boundary and run right across the coupe; ordinarily it is best that they should be along the contours on hill slopes, so as to avoid wash during periods of heavy rains; they should be interrupted near tamarind trees left and at the coppice stools of valuable fuel species but not near the species to be exterminated. The coppice stools of fuel species should have a space of about 5 feet all round them free of all slash to avoid damage in burning. The heaps should be compact, and pressed down as much as possible.

328. In passing the fellings in each strip, and also whenever the coupe is inspected, the Range Officer should take care to see that all these rules are being strictly adhered to. The Forest Guard of the beat concerned should be made to supervise the coupe fellings as often as possible, so that the rules may be followed throughout the period of felling, instead of allowing the works of rectification to accumulate.

329. The following tabular statement gives the order in which the coupes of each felling series should be worked. If one coupe of each felling series is worked every year, the particular years in which the coupes would be worked is also indicated in the statement. The area of each coupe is also noted: but accurate areas for sale each year should be arrived at after surveying the coupes.

Statement of sequence of coupes to be worked in each felling series.

Probable year of working.	Names of the felling series.											
	Pothamadai.		Keerapadi.		Gudaravalli.		Ayerangal.		Pachathanni.		Kottur.	
	Coupe number.	Area on the working plan map.	Coupe number.	Area on the working plan map.	Coupe number.	Area on the working plan map.	Coupe number.	Area on the working plan map.	Coupe number.	Area on the working plan map.	Coupe number.	Area on the working plan map.
(1)	(2)		(3)		(4)		(5)		(6)		(7)	
		ACS.		ACS.		ACS.		ACS.		ACS.		ACS.
1935–36	XV	29·2	IV	19·0	XV	33·2	XV	39·2	VI	35·2	XV	57·2
1936–37	XVI	29·2	V	19·0	XVI	33·2	XVI	36·8	VII	34·0	XVI	57·6
1937–38	XVII	28·0	VI	19·0	XVII	32·4	XVII	37·6	VIII	33·6	XVII	58·8
1938–39	XVIII	28·8	VII	19·0	XVIII	33·2	XVIII	38·4	IX	35·2	XVIII	60·4
1939–40	XIX	30·4	VIII	19·0	XIX	32·8	XIX	36·4	X	35·2	XIX	50·0
1940–41	XX	31·2	IX	19·0	XX	32·0	XX	39·6	XI	35·6	XX	51·2
1941–42	XXI	30·8	X	19·0	XXI	32·0	XXI	38·8	XII	35·2	XXI	52·0
1942–43	XXII	28·8	XI	19·0	XXII	32·0	XXII	45·2	XIII	33·2	XXII	44·4
1943–44	XXIII	27·6	XII	19·0	XXIII	32·0	XXIII	45·6	XIV	37·6	XXIII	41·6
1944–45	XXIV	29·2	XIII	19·0	XXIV	33·2	XXIV	44·8	XV	35·6	XXIV	40·1
1945–46	XXV	28·8	XIV	19·0	XXV	33·2	XXV	44·0	XVI	35·6	XXV	40·2
1946–47	XXVI	30·4	XV	19·0	XXVI	32·4	XXVI	40·0	XVII	36·4	XXVI	40·4
1947–48	XXVII	30·0	XVI	19·0	XXVII	32·0	XXVII	44·0	XVIII	34·4	XXVII	40·8
1948–49	XXVIII	28·8	XVII	19·0	XXVIII	32·4	XXVIII	44·4	XIX	35·2	XXVIII	42·4
1949–50	XXIX	29·2	XVIII	19·0	XXIX	32·8	XXIX	42·8	XX	35·2	XXIX	41·6
1950–51	XXX	28·8	XIX	19·0	XXX	55·6	XXX	44·0	XXI	33·6	XXX	40·4
1951–52	I	28·8	XX	19·0	I	24·3	I	38·1	XXII	33·6	XXXI	42·8
1952–53	II	26·9	XXI	19·0	II	29·5	II	33·1	XXIII	36·0	XXXII	56·0
1953–54	III	36·5	XXII	19·0	III	28·5	III	26·6	XXIV	36·4	XXXIII	56·0
1954–55	IV	35·5	XXIII	19·0	IV	28·0	IV	65·3	XXV	34·8	XXXIV	55·2
1955–56	V	39·9	XXIV	19·0	V	31·0	V	28·1	XXVI	37·2	XXXV	54·4
1956–57	VI	34·2	XXV	19·0	VI	35·0	VI	20·0	XXVII	36·0	XXXVI	54·4
1957–58	VII	44·8	XXVI	19·0	VII	30·9	VII	37·3	XXVIII	34·8	XXXVII	53·2
1958–59	VIII	33·0	XXVII	19·0	VIII	12·0	VIII	36·0	XXIX	33·6	XXXVIII	55·2
1959–60	IX	36·3	XXVIII	19·0	IX	27·0	IX	40·0	XXX	35·2	XXXIX	52·0
1960–61	X	30·0	XXIX	20·0	X	32·5	X	42·3	I	39·4	XL	50·8
1961–62	XI	33·0	XXX	20·0	XI	32·2	XI	44·7	II	26·7	I	33·5
1962–63	XII	31·5	I	21·0	XII	40·0	XII	44·0	III	29·0	II	38·2
1963–64	XIII	39·3	II	20·0	XIII	38·6	XIII	31·9	IV	43·5	III	45·3
1964–65	XIV	40·0	III	14·0	XIV	52·0	XIV	26·0	V	31·6	IV	31·0
1965–66	XV	..	..	..	..	..	..	..	..	..	V	44·4
1966–67		..	..	..	..	..	..	..	..	..	VI	36·2
1967–68		..	..	..	..	..	..	..	..	..	VII	52·7
1968–69		..	..	..	..	..	..	..	..	..	VIII	22·5
1969–70		..	..	..	..	..	..	..	..	..	IX	50·3
1970–71		..	..	..	..	..	..	..	..	..	X	46·0
1971–72		..	..	..	..	..	..	..	..	..	XI	54·0
1972–73		..	..	..	..	..	..	..	..	..	XII	65·7
1973–74		..	..	..	..	..	..	..	..	..	XIII	43·0
1974–75		..	..	..	..	..	..	..	..	..	XIV	53·6

Statement of sequence of coupes to be worked in each felling series—cont.

Probable year of working.	Names of the felling series—*cont.* Nal-Ar. Coupe number. (8)	Area on the working plan map.	Dhali. Coupe number. (9)	Area on the working plan map.	Kamanuthu. Coupe number. (10)	Area on the working plan. map.	Chinn-Ar. Coupe number. (11)	Area on the working plan map.	Amaravati. Coupe number. (12)	Area on the working plan map.	Naval-Oda. Coupe number. (13)	Area on the working plan map.
		ACS.		ACS.		ACS.		ACS.		ACS.		
1935–36	VII	26·4	XII	67·2	XVI	88·0	I	68·0	XVI	70·8	I	44·0
1936–37	VIII	26·4	XIII	69·2	XVII	84·0	II	84·4	XVII	70·0	II	42·4
1937–38	IX	26·0	XIV	78·0	XVIII	78·0	III	76·4	XVIII	69·2	III	31·2
1938–39	X	28·4	XV	77·2	XIX	76·4	IV	74·0	XIX	70·0	IV	33·6
1939–40	XI	34·8	XVI	66·4	XX	110·4	V	74·4	XX	70·0	V	32·4
1940–41	XII	36·0	XVII	67·6	XXI	109·2	VI	68·6	XXI	72·8	VI	31·2
1941–42	XIII	35·6	XVIII	68·0	XXII	112·0	VII	70·4	XXII	72·8	VII	38·4
1942–43	XIV	35·2	XIX	73·6	XXIII	112·0	VIII	74·4	XXIII	71·2	VIII	37·6
1943–44	XV	36·0	XX	70·0	XXIV	108·8	IX	72·4	XXIV	72·0	IX	36·4
1944–45	XVI	24·8	XXI	72·0	XXV	112·0	X	65·0	XXV	72·8	X	36·4
1945–46	XVII	25·2	XXII	70·4	XXVI	84·0	XI	76·8	XXVI	61·6	XI	36·4
1946–47	XVIII	32·8	XXIII	69·2	XXVII	77·2	XII	82·0	XXVII	64·0	XII	44·0
1947–48	XIX	34·0	XXIV	69·2	XXVIII	80·0	XIII	87·2	XXVIII	60·0	XIII	36·0
1948–49	XX	30·8	XXV	64·8	XXIX	80·0	XIV	64·8	XXIX	63·2	XIV	36·4
1949–50	XXI	32·0	XXVI	62·8	XXX	72·0	XV	83·6	XXX	62·8	XV	33·6
1950–51	XXII	32·8	XXVII	64·4	XXXI	72·9	XVI	86·0	XXXI	55·2	XVI	33·6
1951–52	XXIII	32·0	XXVIII	67·6	XXXII	72·8	XVII	78·2	XXXII	64·4	XVII	41·2
1952–53	XXIV	32·0	XXIX	70·0	XXXIII	72·8	XVIII	68·8	XXXIII	59·2	XVIII	36·4
1953–54	XXV	29·6	XXX	69·6	XXXIV	71·2	XIX	57·6	XXXIV	60·0	XIX	38·8
1954–55	XXVI	28·0	XXXI	55·6	XXXV	72·0	XX	70·8	XXXV	54·0	XX	35·6
1955–56	XXVII	31·2	XXXII	66·8	XXXVI	78·4	XXI	72·0	XXXVI	44·0	XXI	33·2
1956–57	XXVIII	30·4	XXXIII	67·2	XXXVII	80·4	XXII	72·0	XXXVII	53·2	XXII	29·6
1957–58	XXIX	31·2	XXXIV	66·8	XXXVIII	86·4	XXIII	72·4	XXXVIII	51·2	XXIII	30·0
1958–59	XXX	31·6	XXXV	68·4	XXXIX	84·4	XXIV	73·2	XXXIX	62·0	XXIV	30·0
1959–60	XXXI	31·2	XXXVI	79·2	XL	85·2	XXV	70·0	XL	56·8	XXV	32·4
1960–61	XXXII	31·2	XXXVII	71·2	I	75·0	XXVI	66·0	I	60·0	XXVI	37·6
1961–62	XXXIII	30·8	XXXVIII	76·8	II	81·1	XXVII	72·4	II	55·0	XXVII	34·0
1962–63	XXXIV	32·4	XXXIX	74·4	III	89·5	XXVIII	72·4	III	66·0	XXVIII	33·6
1963–64	XXXV	34·8	XL	79·2	IV	88·2	XXIX	64·8	IV	46·8	XXIX	33·6
1964–65	XXXVI	28·8	I	81·0	V	69·8	XXX	90·0	V	51·0	XXX	31·2
1965–66	XXXVII	29·2	II	70·3	VI	98·0	XXXI	93·2	VI	52·9	XXXI	31·2
1966–67	XXXVIII	30·8	III	60·7	VII	98·2	XXXII	73·6	VII	75·0	XXXII	33·6
1967–68	XXXIX	30·0	IV	64·2	VIII	84·0	XXXIII	82·0	VIII	57·0	XXXIII	31·2
1968–69	XL	30·4	V	70·0	IX	63·0	XXXIV	86·4	IX	74·0	XXXIV	32·4
1969–70	I	37·2	VI	40·0	X	96·8	XXXV	90·8	X	70·5	XXXV	38·0
1970–71	II	27·5	VII	52·5	XI	84·5	XXXVI	119·6	XI	47·3	XXXVI	32·4
1971–72	III	26·7	VIII	73·0	XII	87·5	XXXVII	82·4	XII	68·0	XXXVII	37·2
1972–73	IV	28·8	IX	66·9	XIII	94·2	XXXVIII	82·0	XIII	76·5	XXXVIII	34·0
1973–74	V	26·0	X	76·2	XIV	96·6	XXXIX	80·0	XIV	75·8	XXXIX	39·6
1974–75	VI	22·0	XI	86·5	XV	94·0	XL	86·4	XV	63·2	XL	32·4

NOTE.—Columns (2) to (6) come under 30 years rotation.
Columns (7) to (13) come under 40 years rotation.

SECTION 4.—REGENERATION.

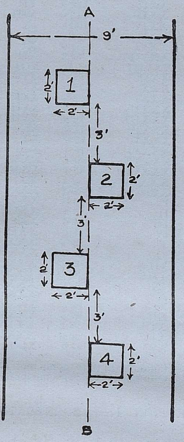
330. The forests in this working circle are understocked and generally open. In the felling series near Sethumadai, lantana is a menace and forms dense thickets inimical to seedling regeneration. A considerable proportion of the growth elsewhere is valueless, including such species as *Gyrocarpus jacquini*, *Balsamodendron berryi*, *Protium caudatum*, *Moringa pterygosperma* and *Dalbergia paniculata*. Natural regeneration of the valuable species from seed is defective: the ground is either generally so hard or so covered with dense lantana or grass that it does not offer a suitable germinating bed for the seeds that fall. The improvement of the stocking in these areas is an urgent necessity: but the low value of the crop precludes expensive measures of artificial regeneration.

331. Experience in fuel coupes in similar forests indicates that 'rab' regeneration, that is, the artificial regeneration of patches on which slash has been burnt, and the resulting ash has been mixed with the soil, gives good results. Such patches are best arranged in interrupted lines, right across the coupe, as by this means inspection and control are facilitated and each line acts to an appreciable extent as a fire break. Both the physical and the chemical effect of the burn on the soil appears to be of value and the comparative freedom from weeds in the burnt patches or 'rabs' for a period of one to three years gives the seedlings a chance to come up. 'Rab' sowings in interrupted lines are therefore prescribed as a definite measure of artificial regeneration to supplement the coppice growth in the fuel coupes.

332. *Burning.*—Under the felling rules in paragraph 327 the contractor is bound to heap the slash in lines about 9 feet wide and at approximately 40 feet intervals: the lines are to be interrupted as often as may be necessary, wherever the stools of valuable species are left for the production of coppice shoots, or where tamarind trees are left unfelled. If the work of artificial regeneration is left until the whole of the coupe has been felled, the result will be that in parts of the coupe, this heaped up debris will be lying for nearly a year unburnt, suppressing any vegetation that may be covered by it, and itself frequently getting partially overgrown with creepers and, further, the effect of the whole monsoon will be lost in establishing fresh seedlings. When the material is finally burnt, the fire will inevitably damage the coppice regrowth in the coupes, that will, some of it, be nearly a year old. It is therefore advisable to burn the lines of slash and regenerate them, in two instalments; and it is prescribed that the burning be done every half

year, once in about August or September before the commencement of the North-east monsoon, and again in about April or May before the South-west monsoon, half of the coupe being treated each time. The burn should be conducted with care on a windless day, and necessary precautions should be taken against the spread of the fire into the adjoining areas.

333. *Soil preparation.*—Immediately after the burn, the soil in the burnt lines should be raked up and mixed with the ash, so that the latter may not be blown or washed away. About 48 hours after the burn the soil is cool enough to work. Within the burnt strips, alternately on each side of a centre line, the soil should be worked up, about six inches deep, in patches two-foot square, spaced approximately every three feet, as illustrated below :—



The patches should be indicated by firm stakes planted close to them.

334. *Sowing.*—At each patch a mixture of seeds of the species selected by the District Forest Officer should be sown and covered with a light layer of soil shortly before the expected outbreak of the north-east or south-west monsoon as the case may be. The quantity of seed to be sown is not definitely prescribed as it depends on the species selected and the stock available. The primary object of prescribing the sowing at patches is to economise where the stock is limited. Where sufficient seed is available the sowings may be extended to the area outside the patches within the burnt lines. A list of species recommended for this artificial regeneration is given in paragraph 342. The recommendations are based on results of work in this as well as in other districts.

What exactly is the best time for sowing the seeds of the various species is not known. Experience will act as a guide and the Provincial Silviculturist should be consulted in the matter periodically.

335. *Casualties.*—Extensive failures in germination should be treated by resowing the patches in the succeeding season.

336. *Planting of teak.*—Planting of teak is prescribed in such parts of the Keerapadi and Villoni series as are suited for the purpose. When the fuel coupe is felled, the District Forest Officer should determine to what extent the soil is suitable for teak. Both these series contain an appreciable area of good quality soil on which teak may be grown which will probably be saleable on a short rotation as a standing crop to considerable financial advantage. The planting will be by stumps; the details are to be found in paragraphs 285 to 288. The following statement gives the areas suitable for such planting and when the time comes for clear-felling these coupes, the District Forest Officer should provide for raising the requisite stumps of teak :—

Statement of areas fit for planting with teak in the Fuel Working Circle, Pollachi range.

Felling series. (1)	Area considered fit for teak planting in acres. (2)
Keerapadi	450 acres. Portions of coupe Nos. I, V, XII, XVI, XXII, XXVIII, XXIX and XXX and the whole of the other coupes.
Kottur	275 acres. Portions of coupes XXII to XXXI.

337. *Choice of species.*—Valuable indigenous fuel species should mainly be selected for sowing in these rab patches. Such species are *Acacia leucophlœa, Acacia ferruginea, Albizzia amara, Albizzia lebbek, Azadirachta indica, Zizyphus jujuba, Chloroxylon swietenia, Sapindus emarginatus, Cassia fistula, Dolichandrone crispa,* etc. The last named has, especially in Cuddapah, proved exceptionally suitable as it germinates readily, grows fairly fast, and is not browsed. To these may be added other indigenous species which have a value as timber or minor forest produce such as teak, *Anogeissus latifolia, Gmelina arborea, Hardwickia binata, Terminalia chebula, Tamarindus indica* (tamarind) and *Anacardium occidentale.* It is left to the District Forest Officer to make the final selection of species for artificial regeneration in each coupe.

338. In addition to the indigenous species named above certain fast growing exotics, suitable for use as fuel, should also be tried. One such species that has given exceptionally good results, almost wherever it has been tried, from Tinnevelly to Cuddapah, is *Cassia siamea.* It can grow remarkably quickly,—up to six feet in height and more in the first season—is hardy, and is not generally browsed. Further it regenerates itself readily. This species should be experimented with.

339. The Provincial Silviculturist should be consulted periodically on this general question of 'rab' regeneration in fuel coupes, and as to the species, both indigenous and exotic, that are found most suitable for the purpose. He is in touch with what is being done in other districts, as well as having a number of experiments of his own under observation.

340. *Podu regeneration.*—The method of 'rab' regeneration prescribed for the fuel coupes approximates to the system of podu regeneration. Regeneration of fuel coupes by tree species along with field crops has not been tried till now in this division, but such a system is not impossible, should the villagers be willing to co-operate. It is already being tried in other districts. And, indeed, in the course of the preparation of this working plan the writer received an application from a villager in Kottur to be permitted to carry out podu in the fuel coupes of Kottur fuel series on the understanding that he should raise tree species along with his field crops. The possibility of improving the stock in the fuel forests by this means seems worth considering, and it is suggested that the District Forest Officer should make further enquiries and endeavour to initiate experiments in this direction. The general lines on which the regeneration should be made will remain the same, except that the cultivator will bear the expense of burning the slash, preparing the soil and weeding the tree seedlings for one year, as indicated in paragraphs 263 to 265.

341. *Collection and storage of seed.*—The District Forest Officer must make suitable arrangements for the collection of a sufficient quantity of seed for his 'rab' regeneration at the correct time, and for its storage. Again the Provincial Silviculturist should be consulted in this matter.

342. The following statement gives the details of the weights of the various seeds, the time when they become available, and the felling series for which they are recommended :—

List showing species proposed for sowing in the fuel coupes of South Coimbatore district.

Serial number and Botanical name. (1)	Tamil name. (2)	Time of flowering (Coimbatore). (3)	Time when seeds are available. (4)	Weight of seed. Number of seeds per ounce. (5-a)	Weight of seed. Volume weight. (5-b)
1 *Acacia leucophloea* ..	Vel-velam	September-October ..	February-March ..	1,400	
2 *Acacia arabica*	Karu-velam	October-November ..	Do.	200	..
3 *Acacia ferruginea* ..	Simai Vel-vel ..	June-July	September	..	..
4 *Acacia planifrons* ..	Odai	Do.	Do.	..	..
5 *Acacia Sundra*	..	....	....	1,100	..
6 *Albizzia amara*	Unjil (arappu) ..	March	August	430	..
7 *Anacardium occidentale* ..	Munthiri	December	March-April	70 to 80 per lb.	..
8 *Azadirachta indica* ..	Veppa maram ..	March-April	July August	160 (50 fruits per oz.)	..
9 *Albizzia lebbek*	Kattu-vagai	March	August-September ..	200	..
10 *Cassia siamea*	Simai avarai	July-October	March	900	1 M.M.= 2 lb.
11 *Cassia fistula*	Sara konnai	April-May	October-November ..	140 to 160	..
12 *Chloroxylon swietenia* ..	Purasu	....	....	4,000	..
13 *Dolichandrone falcata* ..	Katu varsana (kelarathi).	June	February	565	..
14 *Dolichandrone crispa* ..	..	....	....	718	..
15 *Hardwickia binata* ..	Achamaram	July-August	February	110 pods.	..
16 *Pterocarpus marsupium* ..	Vengai	December-April ..	December-March ..	45 "	..
17 *Sapindus emarginatus* ..	Poochikai	December	February	65	..
18 *Tamarindus indica* ..	Puli	September-October ..	February-March ..	30	..
19 *Tectona grandis*	Thekku maram ..	July-August	January-February ..	50	..
20 *Zizyphus jujuba*	Elandai	....	....	50	..
21 *Prosopis spicigera* ..	..	....	March	190	..

343. *Weeding and tending.*—'Rab' sowings have the advantage of comparative freedom from excessive growth of weeds and grass, owing to the destruction of the roots and seeds of weeds in the burn, and it is therefore not expected that much weeding will be necessary. None is therefore prescribed. When necessary a certain amount may be done by the beat guard and watcher, especially after the rains following the sowing

season. The District Forest Officer should also use his discretion and, in case of necessity, employ paid labour for such work. It must be borne in mind, however, that such forest is not of sufficient value to warrant our incurring heavy expenditure on regenerating it.

344. It will be left to the District Forest Officer to decide whether any measures to tend the crop are necessary in later years.

345. *Cost of the operation.*—In the absence of previous experience it is difficult to estimate the cost of 'rab' regeneration of fuel coupes. The cost will no doubt vary with the locality. It is estimated that the cost of regeneration, weeding and tending in the first two years will be approximately Rs. 1–8–0 per acre, an amount found adequate for similar work in North Coimbatore.

SECTION 5.—MISCELLANEOUS REGULATIONS.

346. *Demarcation.*—After the completion of the fellings in the coupe, the salient corners of the coupe should be demarcated by planting stone slabs. The number of the coupe, and the year of exploitation should be engraved on the stone: a common stone may be used for the demarcation of adjacent coupes.

347. *Grazing.*—The subject of grazing generally is dealt with in the Grazing Working Circle. It has been the practice to close the fuel coupes in Pollachi range for a period of five years, while in Udamalpet range the closure has been for seven years. But with the 'rab' system of regeneration now to be introduced, it is necessary to give the young seedlings on the 'rab' lines, a certain measure of protection from browsing and trampling by cattle. It is therefore prescribed that all fuel coupes be closed to grazing for a period of ten years including the year of working.

348. *Fire-protection.*—The fire-protection of the Fuel Working Circle is a difficult problem and measures to ensure fully effective protection would be too expensive in view of the low value of the forests. Preventive measures against incendiarism are impossible: but some measure of protection is necessary to prevent the spread of such fires as may arise. It is therefore prescribed that roads, paths, important rights of way and camping places within the Fuel Working Circle be fire-traced to such extent as is found necessary. About six feet away on either side of the path or right of way where undergrowth and weeds occur, to a dangerous extent, they should be cut on a guide line three feet wide, and thrown on to the margin of the path or road early in January. When the material is sufficiently dry, which will be usually by the end of January, it should be burnt under control. Fire-tracing of the paths, roads and rights of way mentioned in the following statement is considered advisable; but, in sanctioning the annual estimates for the work, the District Forest Officer should use his discretion and should restrict the work to such fire-tracing as is essential, taking into consideration the density of grass or other inflammable matter, the amount of traffic that there may be, and so on.

List of cart-tracks, bridle-paths and foot paths passing through fuel felling series of the South Coimbatore Division that may be fire-traced.

Serial number and particulars of roads and paths. (1)	Length. (2) M.	F.	Felling series in which situated. (3)
1 Sethumadai, Gudaravalli, Keerapadi cart-track	*5	0	Keerapadi and Gudaravalli.
2 Gudaravalli to Ayyasamimudi road trace	*4	0	Do.
3 Sethumadai Top slip ghat road	3	4	Ayerangal and Pachathanni.
4 Punachi ghat road	2	0	Kottur.
5 Navamulai cart-track	1	4	Do.
6 Villoni bridle-path	2	0	Do.
7 Oralapillu cart-track	1	4	Do.
8 Footpath from Vannanthurai to Attikatti road between 2nd and 3rd mile.	1	0	Do.
9 Road to Tirumurthiswamikoil	0	2	Dhali.
10 The enclosure line round Tirumurthiparai enclosure Pachayammankoil.	2	0	Do.
11 Footpath from 11th mile of Udamalpet to Travancore Public Works Department road to Elumalayankoil.	0	7	Do.
12 Kombu rest-house cart-track	1	2	Kamanuthu.
13 A cart-track from 17th mile 7th furlong on Chinnar to Kattiliparai Amman koil	2	0	Chinnar.
14 A cart-track from 17th mile 4th furlong on the Chinnar road to foot of Erumamalai.	2	4	Do.
15 Thirukalthadam from 16th mile 3rd furlong to Kattiliparai Ammankoil.	1	0	Do.
16 Road from reserve line to Manthorai rest-house	4	0	Amaravati.
17 Old line from 7th furlong on the Manthorai rest-house cart-track due east to Navalodai stream.	1	0	Do
Total ..	35	3	

* One of these should, if possible, be fire-traced.

349. For similar work in North Coimbatore Division, a sum of Rs. 6 per mile is found adequate. Based on this fact the cost of fire-tracing 35 miles of paths and roads, with provision for fire-tracing around camping places, would be about Rs. 225 a year. But all the fire lines referred to will not be necessary every year, and the cost may be expected to vary between Rs. 150 and Rs. 200 per annum.

350. *Control.*—The following control records are prescribed for the Fuel Working Circle :—

(*a*) The Control Book for the fellings;

(*b*) the Control Journal for recording points of interest;

(*c*) the Regeneration Ledger with large scale map; and

(*d*) the Record of Works.

Forms of these records are given in Appendix V.

CHAPTER V.—WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

351. The Bamboo Working Circle consists of all the bamboo-bearing areas of the division which can be worked at a profit with the existing extraction paths, or roads and paths which can be advantageously opened up for the purpose, (vide paragraphs 423 and 424). It overlaps the Fuel Working Circle, but extends also into the remoter hills and valleys as bamboos are easily extracted on headloads or by dragging. Bamboos exist also in the Udamalpet range in the block of forest north-east of the Ten-Ar and south of Kaladakattiodai; this area has not been included in the working circle because in the first place, it is the haunt of white bison which are not known to exist anywhere else, and it is considered undesirable to disturb them (vide paragraph 416); and in the second place because the bamboos are inaccessible and cannot at present be extracted at a profit. The working circle has an area of 63,104 acres : its distribution in the ranges and division into felling series is given in the following statement :—

Statement of Bamboo Felling Series—South Coimbatore district in the area covered by working plan.

Serial number.	Range.	Name of the Bamboo Felling Series.	Coupe number.	Area of each coupe in acres.	Boundary description of each coupe.
(1)	(2)	(3)	(4)	(5)	(6)
1	Pollachi	Pothamadai	..	..	Felling Series boundary description :— *North.*—Starting from cairn No. 1 at 903 the boundary runs eastwards along the reserve line to cairn No. 48. *East.*—Thence the boundary runs southwards along the reserve line to the point where the cart track from Sethumadai to Ayyaswami mudi cuts the reserve line north of cairn No. 80. *South.*—Thence westwards along the cart-track to the Malabar district boundary. *West.*—Thence northwards along the district boundary to the starting point (cairn No. 1 at 903)
			I 1936–37 1939–40 1942–43	831	Coupe boundary :— *North.*—Starting from cairn No. 1 at 903 the boundary runs eastwards along the reserve boundary line to cairn No. 48. *East.*—From cairn No. 48 southwards along the reserve boundary line up to the stream crossing the reserve line between cairn Nos. 53-a and 53-b. *South.*—Thence west along the stream running south west to the Malabar district boundary to a point 15 chains north of 3860. *West.*—Thence north-west and north along the district boundary to the starting point.
			II 1937–38 1940–41 1943–44	706 ..	*North.*—The southern boundary of coupe No. I. *East.*—From the point where the stream cuts the reserve boundary between cairn Nos. 53-a and 53-b southwards along the reserve boundary line to cairn No. 63 C. *South.*—From cairn No. 63 C running west and southwest along the stream to the ridge, thence northwestwards along the ridge to a distance of 60 chains to 3860. *West.*—Then northwest along the Malabar district boundary to the southwest corner of coupe No. 1.
			III 1935–36 1938–39 1941–42 1944–45	1,178	*North.*—Starting from 3860 and following the southern boundary of coupe No. II to cairn No. 63 C. *East.*—Thence southwards along the reserve boundary line to a point where the cart-track from Sethumadai to Aiyaswami mudi cuts the reserve boundary line north of cairn No. 80. *South.*—Thence westwards along the cart track to the Malabar district boundary. *West.*—Thence westwards along the Malabar district boundary to the starting point.

Statement of Bamboo Felling Series—South Coimbatore district in the area covered by working plan—cont.

Serial number.	Range.	Name of the Bamboo Felling Series.	Coupe number.	Area of each coupe in acres.	Boundary description of each coupe.
(1)	(2)	(3)	(4)	(5)	(6)
2	Pollachi—*cont* ..	Ayirangal upper in two separate bits.	..	..	Felling Series boundary description :— *Bit I.* *North.*—Starting from the point where the Tekkadi cart-track cuts the reserve boundary line about 30 chains west of Aiyaswami mudi the boundary runs north eastwards along the boundary line of Tekkadi leased forest in Tunakadavu reserve to a point 21 chains south of 3,860 Kuchimalai; thence south along the Malabar district boundary line upto where the Sethumadai Aiyaswami mudi cart-track cuts the district boundary; thence east along the above said cart-track to the point north of cairn No. 80 where the cart-track cuts the reserve boundary line. *East.*—Thence south along the reserve boundary line to 1310 on the reserve boundary line, thence the boundary runs westwards and southwards keeping to the northern and western boundary of Ayeirangal Fuel Felling Series to a point on the ridge about 20 chains up north-west from Anakadavu pallam stream. *West.*—Thence along the ridge 2465, 3056 to Pandaravarai malai 4236 (range boundary), thence north westwards in a straight line to Kattadi mudi 2696, thence to 2753 along the ridge to the southernmost bend of the Tekkadi cart track and west along the cart-track to the starting point. *Bit II.* *North.*—Starting from a point where the Anakadavu pallam cuts the Pollachi range boundary the line runs eastwards along the old Sethumadai road, up to a sharp bend in the abovesaid road, thence southeast to about 15 chains and thence due east to meet the reserve boundary line along the southern boundary of Sarkarpathy enclosure about 3 chains north of cairn No. 120. *East.*—From the last mentioned point the boundary turns southwards and westwards along the reserve boundary up to cairn No. 123, then westwards to about 28 chains to a stream and then south along the stream to its source on the range boundary. *South and west.*—Follows the Pollachi range boundary to the starting point.
			I 1936–37 1939–40 1942–43	1,180	Coupe boundary :— *North.*—Starting from the point where Tekkadi cart-track cuts the reserve boundary line about 30 chains west of Ayyaswami mudi the boundary runs north eastwards along the boundary line of Tekkadi leased forest in Tunakadavu reserve to a point 21 chains south of 3860 Kuchi malai, thence south along the Malabar district boundary line up to where the Sethumadai Ayyaswami mudi cart-track cuts the boundary, thence east along the abovesaid cart-track to the point north of cairn No. 80 where the cart-track cuts the reserve line. *East.*—Thence south along the reserve boundary line to 1310 on the reserve boundary line. *South.*—Thence from 1310 the boundary runs west wards, southwards and eastwards keeping to the northern and western boundary of coupe III of Aiyerangal Fuel Felling Series; thence along the ridge 2064 to Pandaravarai malai 4236. *West.*—From Pandaravarai malai 4236 north-westwards in a straight line to Kathadi Mudi 2696, thence to 2753 along the ridge to the southernmost bend in the Tekkadi cart-track, and west along the cart-track to the starting point.
			II 1937–38 1940–41 1943–44	915	*North.*—Part of the southern boundary of coupe I. *East.*—Part of the western boundary of Ayirangal Fuel Felling Series up to the point 20 chains up to the ridge from Anakadavu pallam stream. *South.*—Nil. *West.*—From the abovementioned point on the ridge the boundary runs northwest and westwards along the ridge 2465, 3056 to Pandaravaimalai 4236.
			III 1935–36 1938–39 1941–42 1944–45	395	*North.*—Starting from a point where the Anakadavu pallam cuts the Pollachi range boundary, the line runs eastwards along the old Sethumadai ghat road up to a sharp bend in the above road, thence southeast to about 15 chains and then due east to meet the reserve boundary along the southern boundary of Sirkarapathi, about 3 chains north of cairn No. 120. *East.*—From the last mentioned point the boundar yruns southwards and westwards along the reserve boundary up to cairn No. 123; then westwards to about 20 chains to a stream and thence south along the stream to its source on the Pollachi range boundary. *South and west.*—Follows the Pollachi range boundary to the starting point.
3	Pollachi ..	.. Ayeirangal Lower ..	..	..	Felling Series boundary :— *North.*—Starting from the north-west corner of coupe III of Ayeirangal Fuel Felling Series the boundary runs along the coupe line eastwards to 1310 on the reserve boundary line. *East.*—Thence turns south and east running along the reserve boundary up to the northwest corner, Sirkarpathi and thence along the western boundary of Sirkarpathi to its southwest corner. *South.*—Thence westwards and north-westwards to the southernmost bend of the old Sethumadai road, thence west along the abovesaid road to the range boundary, thence along the range boundary to the south western corner of the felled fuel coupe No. V of Ayeirangal Felling Series on the range boundary. *West.*—From the last mentioned point the boundary runs north along the western boundary of Ayeirangal Fuel Felling Series to the starting point.

Statement of Bamboo Felling Series—South Coimbatore district in the area covered by working plan—cont.

Serial number.	Range.	Name of the Bamboo Felling Series.	Coupe number.	Area of each coupe in acres.	Boundary description of each coupe.
	(2)	(3)	(4)	(5)	(6)
3	Pollachi—*cont.*	Ayeirangal Lower—*cont.*	I 1936–37 1939–40 1942–43	328	Coupe boundary :— *North* and *East.*—Starting from the point where the old Sethumadai ghat road cuts the reserve boundary line between cairn Nos. 100 and 100-a, the boundary runs south along the reserve boundary up to cairn No. 104, turns east up to 108 and thence again south along the western boundary of Sirkarpathi to its south-western corner. *South.*—From the above mentioned point due west and north-west along the southern and western boundary of coupe 21 Ayeirangal Fuel Felling Series where it meets the old Sethumadai ghat road. *West.*—Thence along the old Sethumadai road to the starting point.
			II 1937–38 1940–41 1943–44	539	*North.*—Starting from the north-western corner of coupe 29 of Ayeirangal Fuel Felling Series on its western boundary (i.e., about 100 chains north of the southernmost corner of Ayeirangal Upper Bamboo Coupe II) the boundary runs eastwards and southwards and again eastwards along the western Felled coupe lines of coupes 10, 9 and 8, and southern boundary of worked coupe No. 8 of Ayeirangal Fuel Felling Series to the reserve line at cairn No. 94, thence along the reserve boundary line to the Sethumadai old ghat road where it cuts the reserve line between cairn Nos. 100 and 100-a. *East.*—Thence part of the old Sethumadai road forming the western boundary of Coupe I of this felling series. *South.*—Thence Sethumadai old road forming part of the northern boundary of Bamboo Coupe No. III of Ayeirangal Upper Bamboo Felling Series and part of the Pollachi range boundary to the point 20 chains up the ridge from Anakadavu pallam. *West.*—Thence northwards along the western boundary of Ayeirangal Fuel Felling Series to the starting point.
			III 1935–36 1938–39 1941–42 1944–45	416	*North.*—Starting from the north-western corner of felled coupe No. 3 of Ayeirangal Fuel Felling Series the boundary runs along the coupe line east to 1310 on the reserve boundary line cairn No. 81. *East.*—From 1310 (cairn No. 81) southwards along the reserve boundary line to cairn No. 94. *South.*—Thence west along part of the northern boundary of Bamboo Coupe No. II Ayeirangal Lower Bamboo Felling Series to its northwest corner. *West.*—Thence northwards along the western boundary of the Ayerangal Fuel Felling Series to the starting point.
4	Pollachi	Pachathanni	.. ..	..	Felling Series boundary description :— *North.*—Starting from a point about 28 chains due west of cairn No. 123 the boundary runs east to cairn No. 123, then along the reserve boundary to a point where a stream cuts the reserve boundary near cairn No. 210. *East.*—Thence south-westwards along the abovesaid stream to 4529, thence southwards along the ridge to a point on the range boundary 20 chains west of Nadu Malai 4712. *South*—Thence along the Pollachi range boundary running west to a point, the source of a stream running north about 10 chains west of Kolambu Malai 3613. *West.*—Thence northwards along the abovesaid stream to the starting point.
			I 1936–37 1939–40 1942–43	2,022	Coupe boundary :— *North.*—Starting from the point where the Up-Ar stream cuts the reserve boundary between cairn Nos. 165 and 166 the boundary runs east along the reserve boundary to the point where a stream cuts the reserve boundary line near cairn No. 210. *East.*—Thence southwestwards along the abovesaid stream to the Station 4529, thence southwards along the ridge to a point on the range boundary 20 chains west of Nadu Malai 4712. *South.*—Thence southwards following the Pollachi range boundary along Sitlulakkai Malai 4663 to the point where the Up-Ar cuts the range boundary. *West.*—Thence the boundary runs north following the Up-Ar stream to the starting point.
			II 1937–38 1940–41 1943–44	1,443	*North*—Starting from the point where a stream cuts the reserve boundary between cairn Nos. 135 and 136 the boundary runs along the reserve boundary to Up-Ar between cairn Nos. 165 and 166. *East.*—Western boundary of Coupe I of this series. *South.*—Pollachi range boundary up to the stream which forms the western boundary of this coupe cutting the reserve line between cairn Nos. 135 and 136. *West.*—The abovesaid stream.
			III 1935–36 1938–39 1941–42 1944–45	563	*North.*—Starting from a point about 28 chains due west of cairn No. 123 the boundary runs due east to cairn No. 123, thence along the reserve boundary up to the stream between cairn Nos. 135 and 136. *East.*—The western boundary of Coupe II of this series. *South.*—Pollachi range boundary up to a [illegible] the source of a stream running north [illegible] chains west of Kolambu Malai [illegible] stream to *West.*—Thence northwards [illegible] the starting point.

Statement of Bamboo Felling Series—South Coimbatore district in the area covered by working plan—cont.

Serial number.	Range.	Name of the Bamboo Felling Series.	Coupe number.	Area of each coupe in acres.	Boundary description of each coupe.
(1)	(2)	(3)	(4)	(5)	(6)
5	Pollachi ..	Villoni ..	..	..	Felling Series boundary description :— *North.*—Starting from a point where a stream cuts the Anamala ireserve boundary between cairn Nos. 210 and 211 the boundary runs east along the reserve boundary line until the reserve boundary cuts the Ali-Ar river between cairn Nos. 320 and 321. *East.*—Thence along the Ali-Ar river up to its meeting point with the Pollachi range boundary. *South.*—Thence along the range boundary running west up to the point 20 chains west of Nadu Malai 4712 ; thence follows the ridge to 4529. *West.*—Thence north-eastwards along the stream to the starting point.
			I 1936–37 1939–40 1942–43	1,585	Coupe boundary :— *North.*—From the point where the Villoni stream cuts the reserve boundary between cairn Nos. 272 and 272 A the boundary runs east along the reserve boundary line up to 1059. *East.*—Thence south westwards along the Pykara Electrical line to meet the Attikatti ghat road at the second mile stand, and then keeps up the above road up to the range boundary. *South.*—Thence along the Pollachi range boundary westwards to the meeting point of the Villoni stream with the Range boundary. *West.*—The Villoni stream to the starting point.
			II 1937–38 1940–41 1943–44	3,534	*North.*—Starting from a point where the stream cuts the Anamalai reserve boundary line between cairn Nos. 210 and 211, the boundary runs eastwards along the reserve boundary line to a point where the Villoni Odai cuts the reserve forest line between cairn Nos. 272 and 272 A. *East.*—Thence the boundary follows the Villoni Odai up to the Pollachi range boundary. *South.*—Then follows the Pollachi range boundary up to the point 20 chains west of Nadu Malai 4712 and thence to 4529. *West.*—From the last mentioned point runs north-eastwards along the stream to the starting point.
			III 1935–36 1938–39 1941–42 1944–45	1,368	*North.*—Starting from Station 1059 on the reserve boundary line the boundary runs eastwards along the reserve line to the point where it cuts the Ali-Ar river between cairn Nos. 320 and 321. *East.*—Thence the Ali-Ar river up to where it meets the Pollachi range boundary. *South.*—Then the portion of the range boundary up to its meeting point with the Attikatti ghat road. *West.*—The eastern boundary of bamboo Coupe No. 1.
	Pollachi ..	Thadaganachi	..	..	Felling Series boundary description :— *North.*—Starting from cairn No. 365 where the Ali-Ar river cuts the Anamalai reserve line the boundary runs north and east along the reserve boundary line up to cairn No. 570. *East.*—From cairn No. 570 along the Anamalai reserve line southwards to cairn No. 660, thence turning eastwards and northwards up to cairn No. 679 to meet the Nal-Ar, thence along the Nal-Ar to its meeting point with the Pollachi range boundary near 1522. *South.*—Part of the Pollachi range boundary up to Ali-Ar river, thence the Ali-Ar river up to cairn No. 321. *West.*—Thence along the reserve boundary line to the starting point.
			I 1936–37 1939–40 1942–43	2,068	Coupe boundary :— *North.*—Starting from the point cairn No. 365 where the Ali-Ar cuts the Anamalai reserve line the boundary runs north and eastwards along the reserve boundary line up to Kundurutti pallam, where it cuts the reserve line at cairn No. 490. *East.*—Thence turning due south along the stream to the main water-shed running along 4594, 3973,3523, 3160, 3030, 2841, 3052 and 2948. *South.*—From the above mentioned point 2948 in a straight line westwards along the Pollachi range boundary to Ali-Ar crossing Navamulai Malai 2985. *West.*—Part of Ali-Ar river and thence along the reserve boundary line to the starting point.
			II 1937–38 1940–41 1943–44	6,100	*North.*—From the point where the Kundurutti pallam cuts the reserve boundary (cairn No. 490), the boundary follows the reserve line. *East.*—Thence part of the reserve boundary line up to the junction of Puliampatti-Ar and the Nal-Ar. *South.*—Thence the boundary runs westwards along the Puliampatti-Ar to its source about 10 chains north of trijunction point 3160. *West.*—Thence along the eastern boundary of Coupe No. I to the starting point.
			III 1935–36 1938–39 1941–42 1944–45	4,242	*North.*—The southern boundary of Coupe No. II. *East.*—From the junction of Puliampatti-Ar and Nal-Ar the boundary runs along the reserve boundary till it cuts the Nal-Ar at cairn No. 679 and thence along the Nal-Ar to its meeting point at the Pollachi range boundary near 1522. *South.*—Part of Pollachi range boundary from 1522 to 2948. *West.*—Part of eastern boundary of Coupe No. I.

Statement of Bamboo Felling Series—South Coimbatore district in the area covered by working plan—cont.

Serial number.	Range.	Name of the Bamboo Felling Series.	Coupe number.	Area of each coupe in acres.	Boundary description of each coupe.
(1)	(2)	(3)	(4)	(5)	(6)
7	Punachi ..	Punachi ..	..	..	Felling Series boundary description :— *North.*—Starting from Chinakan Malai 3483 on the Pollachi range boundary the boundary runs eastwards along the range boundary up to the junction of Pollachi, Punachi and Udamalpet ranges. *East.*—The common boundary between Udamalpet and Punachi ranges until it meets the Tunakadavu-Ar, thence the eastern boundary of the Punachi Timber Working Circle. *South.*—The southern boundary of the Punachi Timber Working Circle. *West.*—The western boundary of the Punachi Timber Working Circle until it meets the starting point.
			I 1936–37 1939–40 1942–43	1,670	Coupe boundary :— *North.*—Starting from the Chinakon Malai 3483 on the Pollachi range boundary the boundary runs eastwards along the range boundary to where it meets the Torakadavu-Ar; thence along the Torakadavu-Ar up to the junction of Ethakulipallam. *East.*—Thence southwards along the Ethakulipallam up to its meeting point with the southern boundary of the Punachi Timber Working Circle. *South.*—Thence to Punachi Timber Working Circle line west of Ethakulipallam. *West.*—Punachi Timber Working Circle line to the starting point.
			II 1937–38 1940–41 1943–44	940	*North.*—Starting from the junction of Ethakulipallam and Torakadavu-Ar the boundary runs east across the Torakadavu-Ar. *East.*—Eastern boundary of Punachi Timber Working Circle. *South.*—Southern boundary of Punachi Timber Working Circle up to Ethakulipallam. *West*—Ethakulipallam..
			III 1935–36 1938–39 1941–42 1944–45	2,900	*North.*—Starting from the junction of Ali-Ar and the Pollachi range boundary running east up to the trijunction of Pollachi, Punachi and Udamalpet ranges. *East.*—The portion of the common reserve boundary between Udamalpet and Punachi ranges up to Torakadavu-Ar. *South and West.*—Thence along the Torakadavu-Ar and Ali-Ar to the starting point.
8	Udamalpet ..	Pundivendayam ..	..	..	Felling Series boundary description :— *North.*—Starting from a point on the ridge about 20 chains south of 1867, the boundary runs eastwards along the top line of Dhali Fuel Felling Series up to Manthorai-Ar. *East.*—Thence southwards along the Manthorai-Ar to Chikka Malai 3742, Kodamurutti Malai 4217, thence southwards to Kottai-Ar up to 4939 on the western slope of the stream. *South.*—Thence in a straight line west to Pichi Malai 6887, Baturava Malai 5990 and Kokkanmalai 4900. *West.*—From the last mentioned point the boundary runs northwestwards and northwards along Thimmigi Malai 5159, 4982 Kopathu-Malai 4057 and in a line due north to 3035, thence along the Nal-Ar stream up to point 3125, thence all along the ridge 3497, 3620, 3133, 3577 to Kallarai Karadu 3663, thence keeping to the ridge west of 3905 to the starting point.
			I 1936–37 1939–40 1942–43	3,854	Coupe boundary :— *North.*—Starting from a point on the ridge about 20 chains south of point 1867 the boundary runs eastward along the top boundary of Dhali Fuel Felling Series up to a point due north of Mulaimadakku 4025. *East.*—From the last mentioned point southwards to Mulaimadakku and keeping along the ridge 3986, 3891, 9068 to Vellai Parai 4279, 4556, Varasatti Malai 5197, and thence along the ridge to Bahirava Malai 5990. *South.*—From the last mentioned point the boundary runs in a straight line westwards to Kokana Malai 900. *West.*—From the last mentioned point the boundary runs north-westwards and northwards along Timmunji Malai 5159 and northwards to 4982, Kopattu Malai 4057 and in a line due north to 3035 thence along the Nal-Ar stream up to point 3125 thence all along the ridge 3497, 3620, 3133, 3577 to Kallarai Karadu 3663 thence keeping to the ridge west of point 3905 to the starting point.
			II 1937–38 1940–41 1943–44	4,910	*North.*—From a point on the Dhali Fuel Felling Series to a line due north of Mulaimadakku 4025, the boundary runs due east along the Fuel Felling Series boundary to a point where it meets the Pal-Ar. *East.*—Thence from the above mentioned point along the Trimurthiparai—Jallimuthanparai foot-paths; thence up the stream due south starting from 5928 on the southern boundary of the felling series. *South.*—From 5928 the boundary runs in a line due west to Bahirava Malai 5990. *West.*—Eastern boundary of Coupe No. I to the starting point.
			III 1935–36 1938–39 1941–42 1944–45	6,360	*North.*—From the point where the top line of the Dhali Fuel Felling Series meets the Pal-Ar the boundary runs eastwards and northwards along the Fuel Felling Series line up to Manalturai-Ar. *East.*—Thence southwards along the Manalturai Ar to Chikka Malai 3742, Kudamurutti Malai 4217, thence southwards to Kottai-Ar up to 4939 on the western slopes of the stream. *South.*—Thence in a straight line westwards to Pichi Malai 6887 and 5928. *West.*—The eastern boundary of Coupe No. II.

Statement of Bamboo Felling Series—South Coimbatore district in the area covered by working plan—**cont.**

Serial number.	Range.	Name of the Bamboo Felling Series.	Coupe number.	Area of each coupe in acres.	Boundary description of each coupe.
(1)	(2)	(3)	(4)	(5)	(6)
9	Udamalpet ..	Isaltittu-Mange-Ar	..	..	Felling Series boundary description (in two bits) :— *First bit.* *North.*—The Isaltittu plateau from Bodinayakan Malai 3467 the boundary runs east to Yelumedu Malai and Senkallu Malai 3729. *East.*—From Senkallu Malai the boundary runs due south an imaginary line passing through Elumalaiyankoil to Peelamalai 3391 due east of Pambu Malai 6632. *South.*—From the last mentioned point 3391 the boundary runs due west to Pambu Malai 6632. *West.*—From the last mentioned point the boundary runs north along the ridge 6164, 5867, 5,257 to Arasiammon Malai 5654, and 3617, Kudamurutti Malai 4217, Chikka Malai 3,742 thence running down to Murigud-Ar and getting up the opposite slope to the starting point 3467. *Second bit.* *North, East, South and West.*—The whole block of bamboos in and around the Mange-Ar Kudi.
			I 1936–37 1939–40 1942–43	3,622	Coupe boundary :— *North.*—The Isaltittu plateau from Bodinayakkan Malai 3467 the boundary runs east to Yelumedu Malai. *East*—From the last mentioned point the boundary runs in a southerly direction along Patu Malai 4304, Piyala Malai 4366, 4150, 4097 to a point near 4781 on the ridge. *South.*—From the last mentioned point the boundary runs due west along Arasiammal Malai 5654 up to the ridge 3617. *West.*—Thence the boundary runs northwards along the ridge Kudamurutti Malai 4217 Chikka Malai 3742 running down to Murigud-Ar and getting up the opposite slope to the starting point 3467.
			II 1937–38 1940–41 1943–44	2,784	*North.*—From Yelumedu Malai to Senkallu Malai and Munuganuthu. *East.*—From Senkallu Malai due south an imaginary line passing through Yelumalayankoil to 3391 due east of Pambu Malai 6632. *South.*—From the last mentioned point 3391 due west to Pambu Malai 6632. *West.*—From the above mentioned point northwards along the ridge 6164, 5867, 5257 to Arasiammal Malai 5654 thence the eastern boundary of Coupe I to the starting point.
			III 1935–36 1938–39 1941–42 1944–45	396	*North, East, South and West.*—The whole block of bamboos in and around the Mange-Ar kudi.
10	Udamalpet ..	Thalingi	..	..	Felling Series boundary description :— *North.*—Starting from the limit of bamboo growth on the foot-path from Thalingi to Athiodai customs checking station on the Travancore side of Athiodai the boundary runs east along the edge of bamboo growth (including the strip of bamboos on either bank of Jambumalai Odai) to the Ten-Ar. *East.*—From the last mentioned point south along the Thalingi Block reserved forest boundary up to Jambumalai 4576. *South and West.*—From the last mentined point the boundary runs along the Thalingi Block reserved forest boundary up to where it meets the foot-path from Talingi to Athiodai customs checking station of Travancore. This series includes the small patches of bamboos occurring along the Athiodai stream until where it meets the Pambu-Ar.
			I 1936–37 1939–40 1942–43	433	Coupe boundary :— *North.*—An imaginary line due east and west from the small hillock shown in the map until it meets the Jambu Malai Odai on the west and Ten-Ar on the east. *East.*—From the lastmentioned point southwards along the Thalingi block boundary to Jambu Malai 4576. *South.*—Part of the southern boundary of Thalingi block up to Jambu Malai Odai. *West.*—Thence along the Jambu Malai Odai to the starting point.
			II 1937–38 1940–41 1943–44	271	*North.*—Starting from a point about 30 chains southeast of 2461, the boundary line runs due east to Jambu Malai Odai, thence north along the limit of bamboo growth (about 2 chains width) on either side of the Jambu Malai Odai up to the footpath from Thalingi to Manjampatti, thence turning south along the edge of bamboo growth up to the northwest corner of Coupe No. I. *East.*—The western boundary of Coupe No. I. *South.*—Part of the Thalingi block reserve boundary. *West.*—An imaginary line running due north from the Thalingi block reserve boundary to the starting point.
			III 1935–36 1938–39 1941–42 1944–45	221	*North.*—Starting from the limit of bamboo growth on the foot-path between Thalingi and Athi Odai customs checking station (on the Travancore side of Athi Odai) the boundary runs along the edge of the bamboo growth towards east up to the north-west corner of Coupe II. *East.*—The western boundary of Coupe II. *South and west.*—Thence along the southern boundary of Thalingi block reserve boundary line up to the foot-path from Thalingi to the Athi Odai customs station on the Travancore side and small patches of bamboo occurring along the Atti Odai stream until it meets the Pambu-Ar.

Statement of Bamboo Felling Series—South Coimbatore district in the area covered by working plan—cont.

Serial number.	Range.	Name of the Bamboo Felling Series.	Coupe number.	Area of each coupe in acres.	Boundary description of each coupe.
(1)	(2)	(3)	(4)	(5)	(6)
11	Udamalpet ..	Manjampatti ..	..	..	Felling Series boundary description :— *North.*—Starting from the westernmost corner of Manjampatti enclosure the boundary runs south-east along the southern boundary of Manjampatti enclosure and thence along the eastern boundary up to the point where it meets the Kumbur-Ar, thence running east along the Kumbur-Ar until where the Kumbur-Ar cuts the Kukkal Block reserved forest boundary. *East.*—From the last mentioned point the boundary runs in a south-westerly direction along the Kukkal and Manjampatti Block reserved forest boundary up to Rettamedu Malai. *South.*—From the last mentioned point the boundary runs west and north-west along the Manjampatti Block reserved forest boundary to Vellangiri Malai 6996. *West.*—From the last mentioned point the boundary runs north-east along Manjampatti Block reserve forest boundary to the starting point.
			I 1936–37 1939–40 1942–43	1,460	Coupe boundary:— *North.*—Starting from the westernmost corner of the Manjampatti enclosure the boundary runs south-east along the southern boundary of Manjampatti enclosure where it meets the Vattavadi-Ar. *East.*—Thence south along the Vattavadi-Ar up to its meeting point on the southern boundary of Manjampatti Block reserve forest. *South.*—Thence west along part of the southern boundary of the Manjampatti Block reserve forest up to Vellangiri Malai 6996. *West.*—Thence along the western boundary of the Manjampatti Block reserve forest to the starting point.
			II 1937–38 1940–41 1943–44	3,002	*North and East.*—Starting from the junction of the northern boundary of the Manjampatti Block reserve forest line and the Kumbur-Ar, the boundary runs south-eastwards and southwards along the Majampatti Block reserve forest line up to Rettamedu Malai. *South.*—Thence the boundary runs west along the southern boundary of Manjampatti Block reserve forest line up to its meeting point with the Vatta Vadi-Ar. *West.*—Thence north along the eastern boundary of Coupe No. I and the Manjampatti enclosure line to the starting point.
			III 1935–36 1938–39 1941–42 1944–45	884	*North.*—Starting from the junction of the Kumbur-Ar with the northern boundary of the Manjampatti Block reserve forest line the boundary runs south-east along the Kumbur-Ar up to the point where it cuts the Kukkal Block reserve forest boundary. *East and South.*—Thence the boundary runs along the Kukkal Block reserve forest boundary running west up to its junction point with the Manjampatti Block reserve forest boundary. *West.*—Thence the boundary runs north along the common boundary of Manjampatti and Kukkal Blocks reserve forests to the starting point.

352. *Character of the vegetation.*—The species of bamboo found in the locality are *Bambusa arundinacea* and *Dendrocalamus strictus* : the former affects moist localities, along banks of streams especially, while the latter is found almost anywhere. The distribution is patchy, and throughout the working circle it occurs mixed with tree growth.

SECTION 2.—METHOD OF TREATMENT.

353. The method of treatment prescribed is a selection thinning among the culms of the bamboo clumps.

354. The correct method of making thinnings in bamboo clumps so as to encourage their growth and get the maximum number of culms from them is a subject still under investigation, and when definite results are known the methods now prescribed may have to be changed. The system of working will therefore follow the usual lines prescribed in modern working plans in South India.

355. There is no record of past flowering in the locality, and it is impossible to surmise when a gregarious flowering may occur. Should such a flowering take place, it will be necessary to have the prescriptions in this working circle altered, so that the extraction of the flowering bamboo may be accelerated before its death. It will also be necessary to devise measures for helping the spread of the bamboo from seeds.

356. *Felling cycle.*—Each of the bamboo felling series will be worked on a felling cycle of three years, a definite coupe being exploited each year.

357. *Regulation of working.*—The yield will be regulated by area, each year one coupe of the felling series being worked. No analysis of the stand has been made to prescribe the yield in culms : but coupes have been formed to give approximately even yields after the inspection of the bamboo stocking of the area.

358. *Method of executing the fellings.*—Demarcation of the coupes prior to exploitation is unnecessary. The coupes have been formed with natural boundaries, and are indicated in the working plan maps. The coupes have been serially numbered and their sequence should be maintained in actual working. The allotment of the coupes to years is indicated in the statement in paragraph 351.

SECTION 3.—EXPLOITATION.

359. *Agency of felling.*—Bamboo coupes should be worked through the agency of contractors only. Coupes may be sold in auction or tenders may be called for at the discretion of the management.

360. *Leases.*—Coupes should be sold every year in the month of March and conveyed to the purchaser before the 1st April, with a voidah of twelve months.

361. *Felling rules.*—The following felling rules should be observed :—

(*a*) Where bamboo coupes overlap the fuel coupe of the year, the bamboo may be clear-felled and shall be the property of the fuel coupe contractor who has bid for all the standing growth in the fuel coupe ;

(*b*) culms should be cut clean, as low as possible but not below a height of one foot from the ground ;

(*c*) no culm shall be removed with the rhizome ;

(*d*) a minimum of six mature culms shall be left in each clump. By mature culm is meant a culm which is at least one growing season old ;

(*e*) no culms which are not mature as defined above may be felled ; and

(*f*) the fellings shall be made as far as possible on the side of the clump opposite to that where the largest number of new culms are found.

362. A tabular statement of the fellings to be made is incorporated in the statement under paragraph 351. Should a coupe not be sold in any one year, it is suggested that it may be put up for sale the next year along with the correct coupe of that year ; whether or not this shall be done will be decided by the Conservator.

SECTION 4.—MISCELLANEOUS REGULATIONS.

363. *Grazing.*—The working circle shall be kept open to grazing at all times.

364. *Fire protection.*—No special fire protection measures except general protection are prescribed for this working circle. The general fire protective measures prescribed in paragraphs 421 to 423 will be applicable to this working circle.

365. *Control.*—The price obtained for the bamboo coupes, and the quantity of bamboos extracted annually will be entered in the control book to be maintained, a form of which is given in Appendix V.

CHAPTER VI.—WORKING PLAN FOR THE SANDAL PROPAGATION WORKING CIRCLE.

SECTION 1.—CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

366. The working circle is composed of the remoter forests of the Udamalpet range below an elevation of 4,000 feet, and not included in the Clear-felling Working Circle. Its area is about 40,000 acres, and is in two blocks—the Pundi Mavadap plateau, and the Thalinji-Manjampatti valley. As it includes all the forests not included in the Clear-felling Working Circle, the boundaries of this working circle are not indicated separately on the map.

367. The existing growth in the working circle is forest of inferior quality, open in most localities, and varying from scrub jungle to a mixed timber forest interspersed with bamboos along the streams. The rainfall varies from 20 to 30 inches in the year. Sandal has been introduced in the past, and is believed to have been sown by the jungle tribes of Udamalpet range who obtained their seed from the adjoining sandal bearing forests of Marayur in Travancore State. It is growing well in several places in which it is regularly flowering and seeding, and which serve as useful propagation centre for the neighbouring localities. On the Pundi-Mavadap plateau sandal thus occurs at Kurumalai and at Elumalayan Kovil covering about 50 acres at each centre. Enumeration over about 14 acres at Kurumalai showed that there were 425 trees and seedlings : at Elumalayan Kovil the growth is even better. At Thalinji over an area of 300 acres sandal is growing well : enumerations over 5 acres revealed the existence of about 288 trees and seedlings. Other places where sandal has been established by the Forest

Department are at Nallar (about ¼ acre—26 saplings), Sinnasera (Dhalli reserve—40 feet square—11 trees), Isalammanthorai bungalow (10 trees), Mayuthu in coupe XII of Kamanuthu fuel felling series (¼ acre—65 trees of all girths). In addition there is, in Punachi range, some sandal at Attakkatti and at lower Punachi though it is not so good as that in the former places in Udamalpet range, conditions being not so suitable.

368. The aim in this working circle is to establish a few healthy trees in detatched localities in an area where sandal does not already exist, so that eventually they will serve as mother trees for the natural spread of sandal, through the agency of birds, streams, etc. The streams flowing through the area are mostly perennial and somewhere or other in their reaches water can always be found. The soil along the stream banks is generally deep and moist, and serves as a suitable bed for sandal, with an ample supply of healthy hosts.

369. For the establishment of sandal propagation centres, the method evolved by the late Mr. H. F. A. Wood and described in detail in the pamphlet on sandal regeneration, compiled in 1932 by Messrs. C. C. Wilson and J. E. M. Mitchell will be adopted. The following prescriptions are based largely on this pamphlet. In addition to these propagation centres if suitable areas can be found the establishment of small plantations by "Podu" may be attempted experimentally at the discretion of the District Forest Officer.

SECTION 2.—REGENERATION.

370. *Choice of propagation centres.*—The Range Officer shall in the first instance, himself select several sites suitable for propagation centres in each beat included in this working circle, taking the Forest Guard with him and instructing him carefully as to the type of site to select. Thereafter the beat guard will select his own sites and the Range Officer will exercise sufficient control over him to see that he does not make mistakes in this important matter. All propagation centres should be indicated on the map prescribed in paragraph 380 below. In selecting sites for these nucleii the following facts should serve as a guide:—

(*a*) Sandal does not generally thrive above an elevation of about 4,000 feet;

(*b*) it cannot spread naturally in evergreen or semi-evergreen forest;

(*c*) it requires considerable lateral shade and depends for its growth on the presence of suitable hosts;

(*d*) the seeds are disseminated by birds as well as by flowing water, and the establishment of sandal trees along streams and close to fruit bearing trees is therefore an advantage; and

(*e*) exposed open localities which do not contain sufficient shade trees are not suitable for the growth of sandal.

371. In each of the ten beats included in the working circle five propagation centres shall be formed annually, a different part of the beat being taken up each year until the whole beat has been sufficiently covered. To prepare a propagation centre, a space about 10 feet in diameter should be cleared of all growth in the middle of a clump of trees or bushes, or on the shady side—preferably the north-east—of such potential hosts. The clearing should be completed in the month of February, and the slash burnt when it is dry, and resulting ash mixed up with the soil, to a depth of 5 or 6 inches. Adequate measures for the prevention of the escape of fire to the surrounding forest must be taken. The plot should be surrounded by a fence about 5 feet high, with a clear space of about one foot at the bottom to allow of free circulation of air.

372. Small stakes shall then be planted over the area at an espacement of about 3 feet by 3 feet. At each stake a shallow saucer about 5 inches in diameter and 2 inches deep shall be made, and a dump of about a dozen seeds shall be spread in each. The seeds shall then be covered over with a layer of straw kept in place, in case of wind, by a stout stick laid across it; this straw shall be kept moist by watering about twice a week, when the weather is not wet. The watering may be discontinued when germination has commenced, if there are occasional showers: but it will be necessary to continue it should there be a prolonged drought after germination.

373. The best time for sowing will be determined by experience, but from the general weather conditions it is expected that sowing may be done late in May when a few showers have already cooled the atmosphere. The south-west monsoon sets in early in June and from then occasional showers can be expected in this locality for about six months.

374. *Casualties.*—Should the May sowings be not sufficiently successful, resowing is prescribed in the month of September. At this time and for subsequent replacement of casualities in the second year, in May and September, in addition to sowing seed, trial

should be made of the method of putting out seedlings, grown in bamboo baskets, together with suitable preliminary hosts as is also described in detail in the pamphlet on sandal regeneration referred to above.

375. *Hosts.*—To provide temporary hosts from the moment the sandal germinates till its roots are sufficiently developed to make attachments with the deeper roots of neighbouring trees, it is prescribed that at the time of preparing the propagation centres the seeds of Dhall (*Cajanus indicus*), and other suitable preliminary hosts be broadcast over each propagation centre.

376. *Weeding and tending.*—Weeding and tending are necessary, but must be done with discretion, bearing in mind that low weed growth, if not too abundant, is useful, as it provides hosts for the sandal in its youth. It must also be borne in mind that sandal needs plenty of lateral shade, especially in its extreme youth, but that, as it develops into the sapling stage it requires overhead light. In no case possible hosts should be destroyed, and where cutting is necessary it is better to lop branches or pollard small trees, rather than fell them. Climbers must be cut whenever they appear.

377. In the areas where sandal has already been established, similar tending operations and climber cuttings are necessary. The District Forest Officer should make a point of inspecting these areas, in the course of his tours, and should give instructions for such tending as may be necessary to promote the development of the sandal.

378. *Seeds.*—It is calculated that for the 50 sandal propogation centres about 50 ounces of sandal seeds will be required every May and about half this quantity for resowing in September. The seed can be obtained from within the range in normal years. All seed should have the pulp removed before sowing, as this promotes more rapid germination, and also lessens the damage done by rats, which is often a serious matter. If much of the seed sown is destroyed by rats, and other vermin, it is helpful to cover each of the small dumps with a rough cage made of small mesh wire netting, which can be pegged down. These cages should be removed when satisfactory germination has been obtained, and stored for use in succeeding years.

379. *Costs of the operation.*—The operations prescribed in this working circle are on a small scale and it is expected that much can be done by the beat subordinates, who should be made responsible for the creation and maintenance of the propagation centres in their beats. To provide for the cost of collecting the seeds, and for a certain amount of labour for fencing and clearing, some provision of funds may be necessary. But this should not exceed Re. 1 per centre, and may possibly be dispensed with altogether.

SECTION 3.—CONTROL.

380. For the operations prescribed in this working circle, the following control records are prescribed :—

(*a*) Map showing the location of the propagation centres; and
(*b*) the control journal for propogation centres.

The form in which the latter is to be maintained is given in Appendix V.

CHAPTER VII.—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

SECTION 1.—CONSTITUTION OF THE WORKING CIRCLE.

381. The minor forest produce working circle covers the whole area of the working plan.

382. The items of minor forest produce collected in the division are given in the statement below. It has not been the practice to obtain correct and full accounts from contractors in the past and consequently the extent to which each of the various items is collected is unknown. The collection of many of the items is only on a small scale. The more important items are the barks of *Cassia fistula* and *Cassia auriculata*, the fruits of *Terminalia chebula*, *Tamarindus indica*, *Elettaria cardamomum*, *Acacia concinna*, and canes, honey and wax.

List of minor forest products collected in the division.

Serial number. (1)	Product collected. (2)	Botanical name. (3)	English name. (4)	Vernacular name. (5)
1	Fruits	*Terminalia chebula*	Gallnuts	Kadukkai.
2	Bark	*Cassia fistula*	Rela bark	Konnai pattai.
3	Do.	*Cassia auriculata*	Tanners senna	Avaram pattai.
4	Fruits	*Tamarindus indica*	Tamarind	Puli.
5	Do.	*Sapindus emarginatus*	Soapnut	Poochakottai.
6	Do.	*Acacia concinna*	Seekoy	Seenikkai.
7	Do.	*Mangifera indica*	Mangoes	Mankai.
8	Do.	*Artocarpus integrifolia*	Jack	Pilakkai
9	Do.	*Phyllanthus emblica*	Indian Gooseberry	Nellikkai.
10	Do.	*Carissa carandas*	Carissa	Kilakkai.
11	Do.	*Feronia Elephantum*	Elephant apple	Vilankai.
12	Do.	*Strychnos potatorum*	Clearing nut	Thettankottai.
13	Do.	*Strychnos nuxvomica*	Nuxvomica	Ettikkai.
14	Do.	*Solanum pubescens*	Wild bringal	Sundakkai and Mullikayi.
15	Do.	*Cocos*	Cocoanut	Thenkai.
16	Do.	*Elettaria cardamomum*	Cardamoms	Elam.
17	Bark	*Ventilago madraspatana*	Buck thorn climber	Vembadampattai.
18	Roots	*Gymnema montanum*	Swallow wort	Mahali.
19	Do.	*Zinziber officinale*	Ginger	Inji.
20	Do.	*Curcuma longa*	Turmeric	Manjal.
21	Leaves	*Murraya Kœnigii*	Curry leaf	Kariveppilai.
22	Do	*Musa paradasiaca*	Plantain leaf	Vazha ilai.
23	Do.	*Cyperus pangarai*	Korai grass	Korai pillu.
24	Do.	*Phœnix humills*	Eacham grass	Eacham pillu.
25	Do.	*Cartalaria juneca*	Fibre	Manjee.
26	Do.	*Arurids dorax*	Grass	Nanal pillu.
27		....	....	Korai kodi.
28	Stem	*Calamus species*	Canes	Pirambu.
29	Do.	*Trichosanthes cucumeria*	....	Peppudal.
30	Gums	*Canarium strictum*	Dammer	Kungilyam.
31		....	Honey	Then.
32		....	Wax	Melugu.
33	Tusk	....	Ivory	Dantham.
34	Horn	....	Deer horns	Man kombu.

383. The existing method of collection of minor forest produce is through the agency of contractors, ivory alone being collected and sold departmentally. The right to collect the various items of produce is sold in auction in convenient units, the more important products such as the barks of *Cassia auriculata* and *Cassia fistula*, and the fruits of *Terminalia chebula* being sold separately. The department receives a lump sum payment from the contractor and all collections and sales of the produce for a year are in his hands. In the case of Punachi range it has been the practice as mentioned in paragraph 165 to sell the produce by arrangement to the Anamalai Planter's Association, the payment in recent years being based on the prices realizable at auctions : this arrangement has been made to avoid friction between planters and contractors because cardamom is a plantation product and there is danger of frequent allegations of theft by collecting coolies, if the wild product is sold to outsiders.

SECTION 2.—METHOD OF TREATMENT.

384. The market for minor forest products is a difficult one, the supply varies greatly from year to year, and the demand is uncertain; therefore the system of collection through the agency of contractors is generally adopted, though in several districts this system is now being gradually replaced by departmental working. An interim during which the latter is the rule is probably necessary in all our forests as at present we have very little accurate knowledge of the value of this produce. In this working plan, however, it is prescribed that excepting for horns and ivory, the right to collect all minor forest produce shall be sold to contractors. The various items of produce shall be treated as follows.

385. *Ivory, horns, etc.*—All ivory and horns shall be collected departmentally and stored in the District Forest office where the sale of the produce shall be held from time to time as the product accumulates sufficiently.

386. *Terminalia chebula.*—Gallnuts have a special value in the tanning industry, and occasionally the prices fetched fluctuate sharply. With the addition of parts of the Madura forest around Manjampatti to this division, the gallnut bearing area is considerably increased. It is prescribed that the right to collect this product be separately leased in the following units :—

(i) Udamalpet range.
(ii) Pollachi range.
(iii) Punachi and Ulandi ranges.

387. *Cassia fistula.*—Konnai bark is collected by coppicing sufficiently old stems and peeling off the bark when the timber is yet green. In order to get properly sized poles, and secure bark containing sufficient tanning content it is found desirable to coppice the stems only once in five years. Consequently the back extraction of *Cassia fistula* has to be done once in five years. The existing system approved by the Conservator is to lease out the right to collect *Cassia fistula* bark over one of the five ranges of the district every year. According to this practice the following rotation of sale is to be in force :—

Year and range leased out—
1934–35—Nil.
1935–36—Ulandi.
1936–37—Udamalpet.
1937–38—Punachi.
1938–39—Pollachi and so on.

This rotation shall be continued, but Tunacadavu range shall be omitted, the produce remaining unsold once in five years. In leasing this product it is necessary to stipulate with the contractor that he is only entitled to the bark, and not to the timber, which he may cut for the extraction of the produce. Where a fuel coupe under working in the year overlaps the lease unit the fuel coupe contractor will be entitled to the fuel.

388. For increasing the stocking of the *Cassia fistula* in the forest, it is prescribed elsewhere that in regenerating rabs in fuel coupes, the seed of this species be also sown.

389. *Cassia auriculata.*—Avaram bark is a valuable tanning material, and the demand for it is fairly uniform. To avoid confusion between the territory of adjacent lessees the right to collect the produce over a whole taluk—porambokes, unreserves and reserves—is leased out together, and the proceeds credited to the forest department. This lease arrangement will be continued in future. In the area dealt with, *Cassia auriculata* occurs only in Udamalpet and Dharapuram taluks, and consequently there is only one lease unit, for the Udamalpet range for the collection of this produce.

390. *Miscellaneous minor forest products.*—Excluding the above products, separately dealt with, items 4 to 32 (inclusive) of the list of products in paragraph 382, shall be treated together. The right to collect all such products shall be leased out together in the following lease units :—

(i) Udamalpet range.

(ii) Pollachi range.

(iii) Punachi and Ulandi ranges.

NOTE.—A part of Ulandi range is included in the working plan for Mount Stuart, but it has been mentioned there that for collection of minor forest products, it is to be dealt with along with Punchai range in view of the proximity of the area to the planting districts.

SECTION 3.—PERIOD OF THE LEASE.

391. All minor forest products shall be leased out according to the existing practice for one year from the 1st July to the 30th June. This year is found to be the most suitable for the harvesting of the various crops.

SECTION 4.—CONTROL.

392. The results of the lease of the various items of minor forest produce and also of the departmental collection of horns and ivory shall be recorded in the control book in the form given in Appendix V. In giving details of the produce collected the accounts furnished by the lessees should be carefully scrutinized in order to get as accurate returns as may be possible.

CHAPTER VIII.—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

SECTION 1.—CONSTITUTION OF THE WORKING CIRCLE.

393. The Grazing Working Circle consists of the whole area dealt with but excludes the following areas :—

(i) The whole of Punachi range except Torakadavu block transferred from Pollachi to Punachi range.

(ii) That portion of Ulandi range which was transferred from Punachi range to Ulandi range in 1931.

The rest of the area covered by the working plan is open to grazing, but all fuel coupes worked in Pollachi and Udamalpet ranges will be closed to grazing for a period of ten years commencing from the year of felling. The department also reserves the right to close

any area to grazing on account of fires or any other cause. As a special case grazing will be permitted in compartment 1 of Punachi Working Circle up to a maximum of 30 head of cattle belonging to the local residents at Attikatti on a special grazing fee of Rs. 2-8-0 per head. This is authorized by Chief Conservator's Proceedings No. 147, dated 17th March 1930. The Pulayars settled in compartments 5 and 6 (*a*) of the Punachi Working Circle, to whom lands have been granted for cultivation on condition that they supply the labour required for departmental works, shall be permitted to graze a maximum of ten head of their own cattle (goats being prohibited) on permits issued free of cost, within the working circle in areas where intensive regeneration has not been done (vide Chief Conservator of Forest's Reference No. 8854/32-C-1, dated 9th November 1932).

394. As stated in paragraph 71 of Part I, the demand for grazing in the division is limited as only 14 per cent of cattle of the villages within 5 miles of the reserve, or 4 per cent of the total number of cattle of Pollachi and Udamalpet taluks are licensed to graze within the reserve. Excluding the area taken over from Madura, the average number of cow units grazed annually within the reserve during the last three years has been only 8,600; this works out to an average grazing incidence of one cow per 17 acres.

395. This, however, does not really give a true picture of the position as the incidence of grazing is no doubt greater along the outer slopes of the hills than in the interior forests, due to the same area being grazed by village cattle every day. Again in the interior of the forest, cattle are penned at approved places for a few months of the year, and close to those pens the grazing is also heavier than elsewhere. Nevertheless, there would seem to be scope for an increase in the number of cattle that may be grazed.

SECTION 2.—METHOD OF TREATMENT.

396. Excluding goats, the animals shown in the list below shall be permitted to graze in the open areas on purchase of permits and subject to the usual conditions attached to the issue of such permits. The approved rates for grazing permits are now as follows :—

	Per year. RS.	A.	P.
Sheep	0	4	0
Cow or bull	0	8	0
Buffaloe	1	0	0
Horse	0	8	0
Ass	0	8	0

Note.—Calves drawing milk from their mothers are allowed free.

397. *Grazing blocks.*—The whole of South Coimbatore forest division forms one block within which cattle possessing permits shall be allowed to graze except in areas specifically closed to grazing (vide Chief Conservator's Proceedings Mis. No. 290, dated 18th June 1932 communicating G.O. Mis. No. 595, Development, dated 29th April 1932 and G.O. Mis. No. 802, Development, dated 11th June 1932). But actually the cattle grazed in the division visit only the area dealt with in this working plan and not the Mount Stuart forests, which are permanently closed.

398. *Penning.*—Penning shall be free as at present : the object is to encourage penning and thereby reduce the incidence of grazing on the outer slopes. Pens shall not be allowed within any of the fuel felling series or closer than half a mile to them : elsewhere penning shall be allowed only at places approved by the District Forest Officer and incorporated annually in the grazing notification published by him. Pens suggested for the purpose are given in the following statement; there may well be other suitable sites, in addition. No new pen shall be opened without the previous approval of the Conservator of the Coimbatore Circle.

Serial number.	Pollachi range.	Punachi range.	Udamalpet range.
1	Pattithittu	Arungapathi	Mavadop.
2	Kokumalaipathi	Gundropathi	Pundi.
3	Thandinaripathi	Thanakkalpathi ..	Balrimalai Foot.
4	Kambukadupathi ..	Thalapattipathi ..	Kurumalai.
5	Gengapathi	....	Vondayam.
6	Avarakotipathi	....	Isaltittu.
7	Puliampattipathi ..	....	Kodanthur.
8	Sellamorat pathi ..	....	Thuvanathupathi.
9	....	....	Thekkamballipathi.
10	....	....	Kumalampathi.
11	....	....	Santhumalaiapatti.
12	....	....	Vanjimalaipatti.
13	....	....	Erumalampatti.
14	....	....	Pattikolathu manthai (patti).
15	....	....	Arugampatti.
16	....	....	Thalinji.
17	....	....	Manjampatti.

399. *Watering facilities for cattle.*—Most of the streams flowing through the area bear water in them for the best part of the year and close to pens there is fair watering facility for cattle at all times. No immediate improvement in this direction is necessary.

400. *Closure of burnt areas.*—When a forest fire occurs and the growth is damaged to such an extent that the closure of the area is essential, the District Forest Officer may close it immediately, up to a limit of 1,000 acres, on his own authority, subject to report to the Collector, for his approval, within ten days. Closure to grazing to be effective must follow swiftly on the occurrence of the fire and should be adequately advertised in the adjoining villages.

SECTION 3.—CONTROL.

401. For the grazing Working Circle a control book shall be maintained; a sample form is given in Appendix V.

CHAPTER IX.—WORKING PLAN FOR THE PROTECTION WORKING CIRCLE.

1.—CONSTITUTION OF THE WORKING CIRCLE.

402. The Protection Working Circle consists of all the forests not included in the Selection, Plantation, Fuel or Bamboo Working Circles. It overlaps the Sandal Propagation, Minor Forest Produce, and Grazing Working Circles. The area of the working circle is approximately 212·9 square miles.

403. Part of the area set aside for Government Cinchona plantations, and certain areas to be assigned to planters fall within the working circle. Scattered within this working circle lie also certain areas within which Pulayars, Kaders, and Muduvars—indigent people living within the forests—are allowed to practice shifting cultivation over small areas as a concession allowed annually by the District Forest Officer. Efforts for some years past have been made to get these people to settle down and these should be continued; shifting cultivation is in its nature destructive and objectionable in a forest, unless done under departmental control, with the object of forming plantations of timber species at the same time.

404. *Vegetation.*—The vegetation consists of all the types described in paragraphs 27 to 36. Timber of importance occurs only over areas which are at present mostly inaccessible.

405. In the evergreen forests, an enumeration of the trees in localities where there is any appreciable stand of *Mesua ferrea* was made and the following statement indicates the results. These areas are shown in the combined Stock and Management map :—

Statement showing the probable yield of sleepers in the Mesua ferre *bearing area of Iyerpadi, Velloni, Sheikalmudi and Savamalai Blocks of the Protection Working Circle of the South Coimbatore Working Plan.*

Block and area.	Particulars.	Yield of *Mesua ferrea* from girth classes. 4′–5′.	5′–6′.	6′–7′.	7′–8′.	8′–9′.	9′–10′.	10′–11′.	11′–12′.	Above 12′.	Total number of B.G. sleepers.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1 Iyerpadi 398 acres.	Number of trees expected ..	1,177	873	405	243	168	48	24	12	3	..	33⅓ per cent of the area was enumerated.
	Number of trees expected to be sound.	557	576	278	156	116	35	17	8	2	..	
	Gross volume of the logs in cubic feet.	18,267	24,768	16,402	12,168	11,484	4,148	2,278	1,164	308	..	
	Net outturn of sleepers in cubic feet.	8,856	12,441	7,839	5,568	4,941	1,707	918	468	126	..	
	Net outturn of sleepers in number.	2,952	4,147	2,613	1,856	1,647	569	306	156	42	14,288	
2 Savamalai 770 acres.	Number of trees expected ..	550	350	390	180	150	60	20	..	10	..	15 per cent of the area was enumerated.
	Number of trees expected to be sound.	260	231	266	116	103	43	15	..	6	..	
	Gross volume of the logs in cubic feet.	8,060	9,933	15,694	9,048	10,197	5,095	2,010	..	924	..	
	Net outturn of sleepers in cubic feet.	4,134	5,205	7,500	4,140	4,389	2,097	810	..	378	..	
	Net outturn of sleepers in number.	1,378	1,735	2,500	1,380	1,463	699	270	..	126	9,551	
3 Sheikalmudi 288 acres.	Number of trees expected ..	234	248	114	76	58	41	23	23	..	..	15 per cent of the area was enumerated.
	Number of trees expected to be sound.	111	164	78	49	40	30	17	15	..	..	
	Gross volume of the logs in cubic feet.	3,441	7,052	4,602	3,822	3,960	3,555	2,278	2,183	..	..	
	Net outturn of sleepers in cubic feet.	1,764	3,543	2,199	1,749	1,704	1,464	918	879	..	..	
	Net outturn of sleepers in number.	588	1,181	733	583	568	488	306	293	..	4,740	
4 Villoni acres 690.	Number of trees expected ..	1,105	713	480	211	129	29	6	6	..	..	10 per cent of the area was enumerated.
	Number of trees expected to be sound.	523	471	327	136	89	21	4	4	..	..	
	Gross volume of the logs in cubic feet.	16,213	20,253	19,293	10,608	8,811	2,489	536	582	..	..	
	Net outturn of sleepers in cubic feet.	8,316	10,173	9,222	4,854	3,792	1,023	216	234	..	..	
	Net outturn of sleepers in number.	2,772	3,391	3,074	1,618	1,264	341	72	78	..	12,610	
Block which falls within Mr. Laurie's Working Plan 1,350 acres.	Number of trees expected ..	1,819	1,446	1,187	718	498	191	77	57	..	..	
	Number of trees expected to be sound.	861	954	809	461	343	138	56	37	..	..	
	Gross volume of logs in cubic feet.	26,691	41,022	47,731	36,036	33,951	16,353	7,504	5,384	..	..	
	Net outturn of sleepers in cubic feet.	28,923	20,607	22,815	16,494	14,613	6,699	3,024	2,166	..	..	
	Net outturn of sleepers in number.	**9,641**	**6,869**	**7,605**	**5,498**	**4,871**	**2,233**	**1,008**	**722**	**..**	**38,447**	

The percentage of enumeration actually conducted is indicated in the statement. In calculating the outturn, yield tables applicable to the Kal-Ar valley have been used making also a similar allowance for unsoundness. The conditions and the quality classes in the above localities are, however, different and inferior to those of the Kal-Ar valley, and consequently the yield cannot be expected to be fully realized. The yield has also been calculated from all the girth classes which would permit of conversion to broad-guage sleepers.

2.—TREATMENT.

406. These forests mostly inaccessible as they are at present, have to be looked upon as protective, and no exploitation or regeneration operations are definitely prescribed for them. In circumstances indicated below it will be permissible for the District Forest Officer with the concurrence of the Conservator to allow the following operations.

407. The Iyerpadi block of evergreen forest is likely to be taken up for Cinchona planting in the near future. As the area is situated on the main ghat road it is readily accessible, and extraction of railway sleepers from the area would be much cheaper and more remunerative than elsewhere in the division. If, then, on further enquiry, it is found that the planting of this area with Cinchona is probable, as soon as the sleeper market revives, the Mesua trees from this locality should all be exploited. Frequently a demand arises for timber from this area to repair bridges on the road and this demand may be met by exploitation of trees from this area. If the area is to be clear-felled and planted with Cinchona, no silvicultural rules need be observed in the extraction. Otherwise, the usual artificial regeneration of any gaps formed by selection fellings will be necessary.

408. North of Savamalai, Sheikalmudi and Villoni estates certain Mesua bearing evergreen forests exist. These were once given for plantations and though the assignments had to be cancelled, they may yet be taken up when the demand for plantation land revives. At present these forests are remote and exploitation would be too costly to be remunerative. If, however, the land is eventually assigned for plantations the question of the exploitation of all timber of value prior to assignment must be considered. Possibly the best procedure would be to fell and convert all such timber prior to assignment, and to insert a clause in the agreements to the effect that free use of roads, subsequently constructed in these areas by the planters, should be allowed for the transport of this produce.

409. North of Sheikalmudi estate certain Mesua bearing evergreen forests exist within the area already covered by Mr. Laurie's working plan. In the course of the enumeration of adjacent sholas, enumeration was also extended to these forests. The estimated stand and yield of sleepers are incorporated in the above statement.

410. Pulayars, Kaders and Muduvars who have lived in the forests from time immemorial continue to do so. Every year they need some land for raising cereals for their sustenance; and the demand is very uncertain depending very much on their whims. It has been the practice for the District Forest Officer to allow them to do shifting cultivation in well-defined areas as a concession from year to year, but this is clearly not a practice to be encouraged, and the efforts that are being made to put a stop to it must be continued. Chief Conservator's Proceedings Mis. No. 532, dated 28th November 1932, communicating copy of G.O. Mis. No. 1454, Development, dated 10th November 1932, permits the District Forest Officer to set aside limited areas for settled cultivation by such people, and in view of the advantages the system has in connexion with the settlement of labour colonies in various parts of the forests, the District Forest Officer should endeavour to replace shifting cultivation by the creation of such settlements, so far as he finds that they are desirable.

411. From the area at Pundi in Udamalpet range within which cultivation by the Pulayars of the locality is permitted, agricultural implements of hard woods such as *Anogeissus latifolia* have been allowed to be removed on headloads, by the plains villagers under the Range Officer's immediate supervision for three days in the year for the last six years. About 300 implements are annually removed resulting in a net revenue of about Rs. 25 a year: this may be continued.

412. At temples such as Elumalaiyankoil and Trimurtiswamikoil, pilgrims assemble in large numbers on certain days in the year. A demand for dry fuel for cooking food on the spot arises, and this has to be provided for if the forests are not to be ruined by indiscriminate hacking. To meet such emergencies the District Forest Officer may allow the removal of deadwood, from specified areas only, of this working circle, devising adequate measures for control and collection of revenue.

3.—FIRE-PROTECTION.

413. Efficient measures of fire-protection are too costly to be practicable of application to the forests of this extensive working circle. Even if such measures were

adopted the continued efficacy of the steps are impossible to ensure. In the circumstances fire-protective measures shall be confined to an area of about 8 square miles of the grass hills of Punachi range. The forests here are patches of shola alternating with growth of grass. Early burning of the grass should be undertaken here annually in order to prevent the probable late fires which prevent the advance of evergreen tree growth into grass land. The fires should be started about 10 feet away from the edge of the sholas and allowed to spread away into the grass. This is the method adopted in this division during the last three or four years, and has been found successful. It is suggested that in the case of one or two of these sholas trenches be dug, showing their present extent, and an experimental plot file opened giving exact details of what has been done, so that it may be clear, after a period of years, whether the sholas have spread or not. Previous experiments made on these lines have not proved of any value as correct records are not obtainable which show what exactly was done. The correct maintenance of the experimental plot registers referred to above is therefore of great importance if the experiment is undertaken at all.

In the conduct of the early burning it should be remembered that fires should be lit between 11 a.m. and 3 p.m., when the grass is just dry enough to burn in patches here and there without extending into a wide conflagration. The test of correct early burning is that it should leave patches of unburnt grass here and there. A ring of fires lighted by several coolies simultaneously has a greater effect than if one man attempts the work by himself. The cost of the early burning of the Punachi grass hills is found from the experience of the last five years to be about Rs. 50 a year.

4.—PROTECTION OF GAME.

414. *The grass hills.*—An area of 43,000 acres on the grass hills around Akkamalai was declared a " game preserve " in G.O. No. 833, Revenue, dated 15th April 1931. This was the outcome of prolonged correspondence on the subject of game preservation. A relevant paragraph from Chief Conservator's Letter No. 5060/28, dated 17th October 1928, is quoted below. The letter refers to an application for land for planting tea on the grass hills. The applicant agreed to withdraw his application if a permanent game preserve was established in the locality. The position is made clear in the Chief Conservator's letter. He says :—

> " Many countries possess national parks and recreation grounds of this kind and it is recommended that so admirable an example be followed. It is not suggested that the area be formed into a sanctuary in which nothing may be shot, but merely that it be preserved from assignment for cultivation, the shooting being regulated as at present or as circumstances may dictate in the future. If the general principle is approved of, the question of what area should be reserved will be taken up with the planters after which specific proposals will be submitted."

As a result of the further proposals submitted the area referred to above was declared a game preserve, and it should continue as such.

415. *The Attikatti game sanctuary.*—An area of about 4,000 acres of reserved forest around Attikatti was constituted a sanctuary for game in 1910 and closed to shooting of all except tiger, panther, pig and wild dog. The procedure has not resulted in any advantage, but, on the other hand, the game has, in the opinion of the Working Plans Conservator, who knew the area twenty-five years ago, definitely decreased. The usual result of making an area a game sanctuary, where legitimate shooting is prohibited, is that poaching increases and it is probable that this has been the case here. Therefore it is suggested that steps be taken to secure the abolition of the sanctuary. Ordinary rules relating to shooting of game in reserve forests would be adequate.

416. *White bison.*—An area of approximately 20,000 acres consisting mainly of the area transferred from Madura district to South Coimbatore forest division and partly of forest in Coimbatore district, has been excluded from bamboo working largely on account of the fact that it contains white bison, which it is desirable to protect, as they are not known elsewhere (vide also paragraph 351). The intention is not that this area should be closed to all shooting, since this, as indicated above, is not considered a measure that, under existing conditions in India, is likely to preserve game. But in this area the shooting of white bison is prohibited by G.O. No. 2570-1/32-10, dated 10th April 1933.

5.—CONTROL.

417. A record of works shall be maintained for this working circle to keep a note of all operations conducted in it. Notes of interest which affect this working circle will be entered in the District Forest Note Book the maintenance of which is to be continued as prescribed in paragraph 440.

CHAPTER X.—MISCELLANEOUS PRESCRIPTIONS AND REGULATIONS.

SECTION 1.—MECHANICAL EXTRACTION METHODS.

418. The exploitation of sleepers or other timber from the Selection Working Circle is attended with difficulties of transport from the coupe to the road. Transport by hand dragging to a central place within the coupe is easy, and would be mostly downhill : coolies skilled in the work are always available. The existing Kal-Ar valley road through the Cinchona plantations, partly metalled, has been extended in 1932–33 to the confluence of the Poo-Ar and the Kal-Ar, and would serve for the transport of the produce from coupes I to III and part of IV. But from other coupes much uphill dragging would be necessary involving an ascent of about 300 to 600 feet.

419. The cost of this uphill dragging would be considerable, and it might well be found that the installation of some form of cheap wire ropeway would reduce costs.

420. Present prices make it unprofitable to extract sleepers from the Kal-Ar valley at all but when prices improve, and an assured market is found, it is prescribed that the Forest Engineer be consulted with respect to the methods of extraction of sleepers from the tract. Sites considered by the writer to be favourable for the location of ropeways are indicated on the working circle map.

SECTION 2.—ROADS AND PATHS.

421. All the departmental roads and paths mentioned in the statement in paragraph 179 should be maintained, with adequate annual repairs.

422. The question of the maintenance of the Kal-Ar valley road, about $4\frac{1}{8}$ miles in length, a continuation of the Government Cinchona road, needs careful consideration. The road was maintained till 1932–33, when sleepers were still being extracted, in agreement with the Cinchona department. Except when sleeper extraction takes place the road is not used, and on that account the question of annual maintenance should not be overlooked. The rainfall here is about *200* inches, and unless drains and culverts are kept clear rapid deterioration of the road is certain. Should sleeper extraction be commenced again, the Forest Engineer should be consulted with respect to the strengthening of the many wooden bridges on this road.

423. New roads of importance, the construction of which is considered advisable for the exploitation of bamboos and fuel during the period of this working plan are the following :—

(*a*) The Chinnar-Thalinji road, commencing from about the 17th mile 4th furlong on the Udamalpet-Chinnar road, with a possible extension to Manjampatti.

(*b*) The Villoni ghat road for a distance of about $2\frac{1}{2}$ miles into the Villoni valley from the 2nd mile 1st furlong of the Valparai ghat road.

Their alignment and cost should be considered in consultation with the Forest Engineer at an early date.

424. The Chinnar-Thalinji road—a distance of about $5\frac{1}{2}$ miles—would be mainly a plains road and is easy to construct from an engineering point of view, except for a bridge over the Chinnar below a point where it joins the Pambar. The construction of this bridge would be costly and can for the present be dispensed with, since bamboos, for the extraction of which the road is mainly required, can easily be floated across the river. The writer estimates that the initial cost of formation of the road will be about Rs. 5,500 at Rs. 1,000 per mile. It is considered desirable to commence the construction of this road at an early date as, when completed, it should appreciably increase the value of the bamboo coupes which it will tap. Enquiries made by the writer show that should a monopoly lease be granted for the bamboos in this locality for a term of years, contractors would be forthcoming who would themselves form the road on one alignment. One great advantage of this road is that it would permit of easy access to the Thalinji and Manjampatti forests without the necessity of passing through the Travancore State forests, with all the attendant disadvantages of tolls and customs at the frontier.

425. In the event of the road to Thalinji proving remunerative, an extension to Manjampatti may then be considered.

426. The Villoni ghat road would be over difficult country, and would require careful alignment. Its construction should be completed if it is to be of use before the end of 1941, in order that coupes XXII to XXXI of the Kottur fuel series, which it is meant to exploit, may be worked without any disturbance of the arrangement of coupes. The road is estimated by the writer to be likely to cost about Rs. 5,000 for the two miles; but the cost will be paid for by the enhanced value of the coupes which it will serve even in the first rotation.

427. Small cart-tracks leading into fuel coupes will be needed from time to time for extraction from individual coupes. Contractors usually make them themselves and they

may be allowed to continue to do so. But the District Forest Officer should see that sufficient supervision is exercised and help given to the contractors to ensure that the tracks are, as far as possible, laid out to form ultimately a connected chain of tracks. It will be advisable to align the tracks in advance when coupes are surveyed and indicate them on the maps when coupe sketches are furnished at the time of the sale.

428. The Nallar fuel series is situated in difficult country, and the material goes mostly for consumption, to the mill at Paruthiyur. The price obtained by the sale of the coupes is not sufficiently good to warrant departmental capital outlay on the construction of a road to serve the coupes. But on enquiry the writer was informed that certain contractors would be prepared to construct the cart-track themselves on our alignment should a lease of the coupes of the fuel series be given to them for a definite period of years. The system of giving such leases for a few years consecutively will often serve as an inducement to contractors to construct permanent cart-tracks of this description. It is worth their while to do so if they themselves are assured of the benefits that will result for a reasonable period. It is therefore suggested that the District Forest Officer should consider the system for this locality.

SECTION 3.—FIRE-PROTECTION.

429. The fire-protection operations to be conducted are referred to in the working plan for each working circle.

430. Reports of fire-occurrence should be obtained with promptitude, and every report should be scrutinized by the District Forest Officer to see that the report gives all the information required. When possible the District Forest Officer or his assistant should inspect the scene of a fire. Intentional fires occur often in localities subject to illicit fellings, and only frequent inspection by responsible officers will keep such malpractices in check.

431. A cloth tracing of a map on a scale of one inch to one mile shall be maintained in the District Forest office, and in the Range offices, and the area and extent of all fires shall be indicated on it.

SECTION 4.—BUILDINGS.

432. For camping while inspecting the important works prescribed in this working plan, there are adequate rest-houses in the locality. The existing buildings of the department mentioned in paragraph 179 should be maintained with adequate annual repairs.

SECTION 5.—ESTABLISHMENT.

433. The existing staff is considered adequate for the purpose of carrying out all the works prescribed in this working plan except in the Selection Working Circle. Should the market for sleepers revive and the exploitation of the Selection Working Circle be taken on hand, it is probable that a special duty ranger and two additional foresters may be required to carry out the work efficiently. This matter will have to be settled when the occasion arises.

434. Reckoning at average rates of the time scales of pay, the cost of the present staff of the division debitable to the working plan area is as follows :—

Statement showing the average cost of establishment for ten years from 1935–36 to 1944–45.

Serial number and details of staff employed.	Number.	Average cost per mensem for each post.	Cost for the ten years.	Cost for the area of the working plan for ten years.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A.	RS.	RS.	
A. Executive Staff.					
1 Deputy Conservator of Forests	1	997 0	1,19,640	..	Overseas pay is excluded. Three-eighths of cost of items 1 and 2 is taken.
2 Extra Assistant Conservator of Forests ..	1	547 0	65,640	69,480	
Pollachi Range.					
3 Forest Ranger	1	138 0	16,560		
4 Forest Guards	8	17 0	16,320		
5 Forest watchers	8	10 0	9,600	42,480	
Punachi Range.					
6 Forest Ranger	1	138 0 45 0 (Special pay)	21,960		
7 Forest guards	7	17 0 3 0 (Special pay)	16,800	38,760	
Udamalpet Range.					
8 Forest Ranger	1	138 0	16,560		
9 Forest guards	11	17 0 3 0 (Special pay)	23,160		Special pay of Rs. 3 is for two guards only in Udamalpet. range.
10 Forest watchers	9	10 0	10,800	50,520	

Statement showing the average cost of establishment for ten years from 1935–36 to 1944–45—cont.

Serial number and details of staff employed.	Number.	Average cost per mensem for each post.	Cost for the ten years.	Cost for the area of the working plan for ten years.	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
		RS. A.	RS.	RS.	
		B. OFFICE ESTABLISHMENT.			
		District Forest Office.			
11 Head clerk	1	80 0	9,600		
12 Accountant	1	70 0	8,400		
13 Clerks	5	47 8	28,500		
14 Draughtsman	1	65 0	7,800		
15 Typist	1	47 8	5,700		
16 Peons	5	15 0	9,000		
17 Office watcher	1	12 0	1,440	26,415	Three-eighth cost of items 11 to 17 is taken.
		Pollachi Range.			
18 Clerk	1	47 8	5,700		
19 Peon	1	15 0	1,800		
20 Bungalow watcher	1	10 0	1,200	8,700	
		Punachi Range.			
21 Clerk	1	47 8 13 8 (Special pay)	7,320		
22 Peon	1	15 0 2 0 (Special pay)	2,040	9,360	
		Udamalpet Range.			
23 Clerk	1	47 8	5,700		
24 Peon	1	15 0	1,800	7,500	The whole cost of items 18 to 24 is taken.
		Total cost for ten years ..		2,53,215 or 2,53,200	
		Total cost for one year ..		25,320	

SECTION 6.—LIVESTOCK.

435. The only timber operations which would require the help of animals for haulage are in the selection fellings in the Punachi Plantation Working Circle. The annual output of timber from this working circle is estimated to be about 12,500 cubic feet. With the expansion of the contract system of fellings, it is believed to be possible to discontinue departmental exploitation and dispense with the use of elephants altogether. Should contract working be found impossible, elephant labour for the haulage of about 12,500 cubic feet of timber a year to roadside depots involving a drag lead of about half a mile will be necessary. It is estimated that two elephants could do the work in a period of six months. In making the financial forecast, the cost of this dragging has been estimated at two annas per cubic foot and a sum of Rs. 500 provided for.

SECTION 7.—STORES AND TOOLS.

436. For the regeneration operations in the Selection, Plantation and Fuel Working Circles, implements such as forks, mamuties, crowbars and rakes will be required. A provision of Rs. 2,000 is considered adequate for the purchase of these stores in a period of ten years.

SECTION 8.—CONTROL.

437. The District Forest Officer will be held responsible for the correct maintenance of all the control records prescribed. The control records for each working circle are referred to in the working plan for it.

438. The regeneration ledger should be posted up by the Range Officer every month, or as often as any work is carried out. Entries in the regeneration ledger should be scrutinized and verified by the District Forest Officer or his assistant whenever an inspection is made. A copy of the regeneration ledger should also be maintained in the District Forest office.

439. Worked coupes should be posted up in the control maps every year in April when the control records are posted up.

440. It is prescribed that the District Forest Note Book be continued to be maintained to record information which is not posted in the control records prescribed in this working plan.

441. *Control Journal.*—The control journal will be kept by the District Forest Officer himself and his gazetted assistants, as laid down in the Forest Department and Account Code, section 50. It should be maintained for such of the headings given in Appendix 8

of the Code as are applicable to each of the working circles for which a journal is prescribed, and, in addition, under such other headings as the District Forest Officer may consider desirable.

The purpose of the control journal is to record all useful and interesting observations made in the field and items of information that are not recorded elsewhere. All entries should be signed and dated. Suggestions for the improvement of existing practice should be made freely.

Financial results of working compared with the working plan forecast must find place in the control journal as ordered in Chief Conservator's Proceedings Mis. No. 436, dated 30th September 1933, communicating G.O. Mis. No. 1133, Development, dated 18th September 1933. In Appendix V are given in detail suggested headings that are considered suitable.

CHAPTER XI.—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

442. The following financial forecast, estimated conservatively, under existing conditions of prices indicates the probable results of working of these forests for the period of this working plan :—

REVENUE.		EXPENDITURE.	
Item number and particulars.	Amount.	Item number and particulars.	Amount.
	RS.		RS.
I. Evergreen Selection Working Circle.			
1 By sale of sleepers extracted from coupes I to X: total number of sleepers 122,659 B.G. units (paragraph 224) at Rs. 6 per sleeper ..	7,35,954	1 Cost of extraction of sleepers and carting them to Pollachi from coupes I to X: total number of sleepers 122,659 at Rs. 4-13-0 per sleeper including haulage, repairs and improvement of roads and buildings, pay and allowances of two temporary foresters and one Ranger engaged on the work, loss on rejection at Pollachi approximately at 7 per cent	5,90,296
		2 Artificial regeneration of gaps at 400 gaps per coupe for the 10 coupes = 4,000 gaps at 12 annas per gap based on experience on similar work in Wynaad (paragraph 238) ..	3,000
Total Revenue ..	**7,35,954**	Total Expenditure ..	**5,93,296**

Explanatory remarks.—The sale price of the sleepers is based on the figure at which it is proposed to sell them this year. They have been unsaleable in the recent past; but the situation is now improving. The cost of extraction is estimated liberally; with improvement in methods of transport, it is sure to be less. There is a reasonable anticipation that the estimated net profit can be realized.

REVENUE.		EXPENDITURE.	
II. Punachi Plantation Working Circle.			
1 Clear-felling—		1 Clear-felling—	
		(i) Demarcation of 10 coupes (paragraph 266)	90
Expected revenue by the sale of 10 coupes standing to contractors at Rs. 30 per acre. Total area 255 acres (paragraph 261)	7,650	(ii) Cost of planting and weeding 230 acres (9 coupes) at Rs. 18 per acre (paragraph 293)	4,140
		(iii) Fire protection of the above area for 10 years at Rs. 130 per year (paragraph 306)	1,300
2 Selection felling—		2 Selection felling—	
Expected revenue by the sale of 1,25,000 c.ft. of timber in 10 years at 12 annas per c.ft. at the Forest Depot (paragraph 295)	93,750	For marking and extraction of 125,000 c.ft. of timber including elephant dragging, feeding elephants and medical establishment charges at Re. 0-3-2 per c.ft. (paragraphs 296, 298 and 435) ..	24,740
By sale of 20 sets of spokes and felloes per year at Rs. 12 per set at Pollachi for 10 years	2,400	Tending operations in the selection felled areas at Rs. 50 per year (paragraph 299)	500
		Conversion of 20 sets of spokes and felloes per year and transport to Pollachi at Rs. 8-8-0 per set for 10 years	1,700
Total Revenue ..	**1,03,800**	Total Expenditure ..	**32,470**

III. Fuel Working Circle.

REVENUE.

Item number and particulars.	Amount. RS.
1 By sale of the following coupes to contractors (paragraph 329)—	
(1) Pothamadai series coupes XV to XXIV = 293 acres at Rs. 60 (average of past 10 years)	17,580
(2) Ayerangal series coupes XV to XXIV = 402 acres at Rs. 56 (average of past 10 years) ..	22,512
(3) Gudaravalli series coupes XV to XXIV = 326 acres at Rs. 50 (average of past 10 years) ..	16,300
(4) Kottur series coupes XV to XXIV = 513 acres at Rs. 36 (average of past 9 years)	18,468
(5) Keerapadi series coupes IV to XIII = 190 acres at Rs. 55 (average of past 3 years)	10,450
(6) Nallar series coupes VII to XVI = 310 acres at Rs. 5 (average of past six years)	1,550
(7) Pachathanni series coupes VI to XV = 350 acres at Rs. 64 (average of past three years)	22,400
(8) Dhali series coupes XII to XXI = 709 acres at Rs. 15 (average of past six years)	10,635
(9) Kamanuthu series coupes XVI to XXV = 991 acres at Rs. 30 (average of past 10 years) ..	29,730
(10) Amaravati series coupes XVI to XXV = 712 acres at Rs. 15 (average of past nine years) ..	10,680
(11) Navalodai series coupes I to X = 364 acres at Rs. 20 (probable price expected)	7,280
(12) Chinnar series coupes I to X = 728 acres at Rs. 25 (probable price expected)	18,200
Total Revenue ..	**1,85,785**

EXPENDITURE.

Item number and particulars.	Amount. RS.
(i) Demarcation of 7 series in Pollachi range annually (paragraph 324) ..	200
(ii) Demarcation of 5 series in Udamalpet range annually (paragraph 324) ..	100
10 × 300	= 3,000
Rab regeneration and tending for 10 years (paragraph 345) 5,888 acres at Rupees 1–8–0 per acre (including collection of seed)	8,832
Fire protection by fire tracing cart-tracks, bridle-paths and foot-paths, passing through the fuel felling series over a length of about 35 miles a year at Rs. 6 per mile. Lump sum amount provided per year, Rs. 175 (paragraph 349)	1,750
Total Expenditure ..	**13,582**

Explanatory remarks.—The annual revenue now is Rs. 13,888 for the whole working circle. According to the present working plan it will be Rs. 18,578. The surplus of nearly Rs. 5,000 a year is due to addition of two new series, Navaloadai and Chinnar in Udamalpet range and to other minor difference in areas of coupes.

IV. Bamboo Working Circle.

REVENUE.

Item number and particulars.	Amount. RS.
1 By the sale of the following coupes to contractors (paragraph 351)—	
(1) Punachi series at Rs. 150 per year (probable price expected)	1,500
(2) Villoni series at Rs. 778 per year (average of past three years approximately)	7,780
(3) Pothamadai series at Rs. 593 per year (average of past three years approximately)	5,930
(4) Ayerangal Upper series at Rs. 742 per year average of past three years approximately)	7,420
(5) Ayerangal Lower series at Rs.543 per year (average of past three years approximately)	5,430
(6) Thadaganachi series at Rs. 483 per year (average of past three years approximately)	4,830
(7) Pachathanni series at Rs. 752 per year (average of past three years approximately)	7,520
(8) Pundi-Vendayam series at Rupees 300 per year (probable price expected)	3,000
(9) Isalthittu, Elumalaiyankoil and Mangaiyar series at Rs. 100 probable price expected)	1,000
(10 & 11) Thalinji and Manjampatti series combined at Rs. 2,000 per year (a conservative estimate likely to improve considerably on the opening of the Thalinji road).	20,000
Total Revenue ..	**64,410**

Total Expenditure .. Nil.

Explanatory remarks.—The annual revenue at present (average from 1926–27 to 1932–33) for the working plan area is Rs. 5,430. According to this working plan it will be 6,440 annually. The increase of Rs. 1,000 per year is mainly due to addition of Manjampatti Bamboos in Udamalpet and Attikatti Bamboos in Punachi ranges.

REVENUE. Item number and particulars.	Amount. RS.	EXPENDITURE. Item number and particulars.	Amount. RS.
V. Sandal Working Circle.			
1. No revenue is expected		1 Opening of 50 propagation centres every year and cost of collection of seeds, etc., for the ten years at Re. 1 per centre per year (paragraph 379)	500
Total Revenue		Total Expenditure ..	**500**
VI. Minor Forest Produce Working Circle.			
1 (1) Sale of Ivory and horns collected departmentally at Rs. 250 a year (paragraph 385)	2,500	1 Transport of minor forest produce such as elephant tusks and horns for sale for all ranges at Rs. 50 a year ..	500
(2) Gall-nuts in Udamalpet range including Manjampatti addition at Rs. 1,500 a year (paragraph 386)	15,000		
(3) Gall-nuts in Pollachi range at Rs. 60 per year (average of past three years approximately) (paragraph 386)	600		
(4) Gall-nuts in Punachi and Ulandi ranges at Rs. 50 per year (based on 1932–33 actuals) (paragraph 386)	500		
(5) Konnai bark in all the four ranges at Rs. 50 a year for eight years (paragraph 387)	400		
(6) Avaram bark lease in Udamalpet range (paragraph 389) at Rs. 775 per year	7,750		
(7) Minor forest produce in Udamalpet range at Rs. 1,700 per year (average of past three years) (paragraph 390)	17,000		
(8) Minor forest produce in Pollachi range at Rs. 2,000 per year (average of past three years approximately) (paragraph 390)	20,000		
(9) Minor forest produce in Punachi and Ulandi ranges at Rs. 1,200 per year (paragraph 390)	12,000		
Total Revenue ..	**75,750**	Total Expenditure ..	**500**
VII. Grazing Working Circle.			
1 (1) Punachi range—Grazing revenue for ten years (based on average of past five years)	487		
(2) Pollachi range—Grazing revenue for ten years (based on average of past five years)	21,006		
(3) Udamalpet range—Grazing revenue for ten years (based on average of past five years)	24,640		
Total Revenue ..	**46,133**	Total Expenditure ..	..
VIII. Protection Working Circle.			
1 By sale of shola timber at seigniorage rates to purchasers at Rs. 50 a year (based on past average)	500		
Total Revenue ..	**500**	Total Expenditure ..	..

Miscellaneous item of revenue.

Item number and particulars. (1)	Amount. (2) RS. A. P.	Remarks. (3)
1 Sale of agricultural implements in Udamalpet range at Rs. 35 per year for ten years.	350 0 0	
2 Sale of dead fuel to tea-shop keeper at Attikatti at Rs. 25 a year for ten years.	250 0 0	
3 Sale of dead fuel for supply to pilgrims of Elumalaiyankoil and Trimurtiswami koil in Udamalpet range at Rs. 50 a year.	500 0 0	
4 Rents for bazaars and shop-sites in Punachi range at Rs. 300 a year.	3,000 0 0	
5 Rents for cultivation of vacant lands in Pollachi range at Rs. 75 a year.	750 0 0	
6 Rents for depot-sites and weigh-bridge at Rs. 235 a year.	2,350 0 0	

Miscellaneous items of revenue—*cont.*

Item number and particulars. (1)	Amount. (2)	Remarks. (3)
	RS. A. P.	
7 Compounding fees in Punachi, Pollachi and Udamalpet ranges at Rs. 2,000 a year.	20,000 0 0	
8 Sale of miscellaneous permits in Punachi, Pollachi and Udamalpet ranges at Rs. 75 a year.	750 0 0	
9 Shooting licence fees at Rs. 300 a year for three ranges.	3,000 0 0	
10 Drift and waifwood along river banks and sale of other confiscated produce at Rs. 200 a year.	2,000 0 0	
11 Fines and forfeitures at Rs. 200 a year	2,000 0 0	
12 Refunds by Forest Officers of revenue at Rs. 50 a year.	500 0 0	
13 Rents of buildings in Punachi, Pollachi and Udamalpet ranges both residential and non-residential at Rs. 1,000 a year.	10,000 0 0	
14 Rent recoveries on account of Public Works Department buildings at Rs. 78 per month.	3,510 0 0	
Total Revenue ..	**48,960 0 0**	

Revenue from other sources.—The following statement shows the estimated revenue from other sources, for the period 1935–1945 :—

Item number and particulars. (1)	Amount. (2)	Remarks (3)
	RS. A. P.	
VIII. FORESTS.		
1 Revenue from forest produce collected by the Revenue Department—		
RS.		
(1) Timber 1,664		
(2) Firewood and charcoal .. 1,751		
(3) Other minor forest produce .. } (4) Drift and waifwood and other confiscated produce. } 2,128		
Total .. **5,543** × **10** =	55,430 0 0	
Total Revenue ..	**55,430 0 0**	

The following statement is the estimated expenditure on works, other than those that relate specifically to the several working circles, for the period 1935–1945 :—

Item number and particulars. (1)	Amount. (3)	Remarks. (3)
	RS. A. P.	
1 8 b. Conservancy and works— Renewals and replacements of stores, tools and plant at an average of Rs. 200 per year (paragraph 436).	2,000 0 0	
2 D. 1. Roads and buildings— Interest on total cost of construction of Chinnar-Thalinji road length 5½ miles and the Villoni road length 2½ miles (paragraphs 424 and 426) at 5 per cent per annum on Rs. 11,500 for 5 years.	2,900 0 0	
3 Repairs to roads and communications in Punachi, Pollachi and Udamalpet ranges at Rs. 920 a year (paragraph 421).	9,200 0 0	
4 D. 2. Buildings— Repairs to residential and non-residential buildings of Punachi, Pollachi and Udamalpet ranges at Rs. 920 a year (paragraph 432).	9,200 0 0	
Repairs to pipe lines at Waterfall at Rs. 10 a year ..	100 0 0	
Repairs to wells in Pollachi and Udamalpet ranges at Rs. 25 a year.	250 0 0	
5 E. b. Fire-protection— Fire-protection of sholas on grass hills at Rs. 60 a year (paragraph 413).	600 0 0	
6 Maintenance of boundaries in Punachi, Pollachi and Udamalpet ranges at Rs. 425 a year.	4,250 0 0	
7 Clearing growth round residential buildings as anti-malarial measures in Punachi, Pollachi and Udamalpet ranges at Rs. 200 a year.	2,000 0 0	
8 Honorarium and rewards for informants in Forest offences at Rs. 100 a year.	1,000 0 0	
Total Expenditure ..	**31,500 0 0**	

Establishment.—The following statement shows the estimated expenditure for the period 1935–1945 :—

Item number and particulars. (1)	Amount. (2) RS. A. P.	Remarks. (3)
8. c Establishment.		
1 Controlling staff—Non-voted—		
District Forest Officer : A Deputy Conservator of Forests on an average salary of Rs. 997 per mensem.	44,865 0 0	Three-eighths of the whole cost.
2 Controlling staff—Voted—		
1 Extra Assistant Conservator of Forests, on an average salary of Rs. 547 per mensem.	24,615 0 0	Do.
3 Executive staff—Voted—		
Three rangers, one on an average salary of Rs. 138 — Rs. 45 (Special pay) per mensem and two on an average salary of Rs. 138 per mensem.	55,080 0 0	
4 Twenty-six forest guards, 17 on an average salary of Rs. 17 per mensem and nine on an average salary of Rs. 17—Rs. 3 (Special pay) per mensem.	56,280 0 0	
Office Establishment.		
5 District Forest Office Establishment comprising—		
Head Clerk 1		
Accountant 1		
Second clerk 1		
Third clerk 1		
Fourth clerk 1		
Fifth clerk 1		
Sixth clerk 1		
Draftsman 1		
Typist 1		
Peons 5		
at an average monthly cost of Rs. 575	25,875 0 0	Three-eighths of the whole cost.
6 Range office establishment—		
Three range clerks, one on an average salary of Rs. 47–8–0 — Rs. 13–8–0 (Special pay) per mensem and two on an average salary of Rs. 47–8–0 per mensem.	18,720 0 0	
7 Three range peons, one on an average salary of Rs. 15 — Rs. 2 (Special pay) per mensem and two on an average salary of Rs. 15 per mensem.	5,640 0 0	
8 Temporary establishments—		
Seventeen reserve watchers at Rs. 10 per mensem.	20,400 0 0	
9 One office watcher at District Forest Office at Rs. 12 per mensem.	540 0 0	Three-eighths of the whole cost.
10 One bungalow watcher at Rs. 10 per mensem ..	1,200 0 0	
11 Travelling allowance, non-voted, averaging Rs. 2,400 per annum.	9,000 0 0	Three-eighths of the whole travelling allowance.
12 Travelling allowance—Voted	23,900 0 0	
13 Other compensatory allowances averaging Rs. 540 per annum.	5,400 0 0	
14 Contingencies, supplies and services	20,373 0 0	
Total expenditure ..	**3,11,888 0 0**	

Direction expenses.—The proportionate share of the establishment of the Conservator of Forests, Coimbatore Circle, chargeable to the South Coimbatore division is estimated at Rs. 9,517 per annum of which three-eighths share is apportioned to the present working plan area=Rs. 3,567 per annum or Rs. 35,670 for the whole period of this working plan.

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Abstract of estimated revenue and expenditure.

Item number and particulars. (1)	Amount of revenue. (2)	Amount of expenditure. (3)
	RS.	RS.
1 Evergreen Selection Working Circle	7,35,954	5,93,296
2 Punachi Plantation Working Circle	1,03,800	32,470
3 Fuel Working Circle	1,85,785	13,582
4 Bamboo Working Circle	64,410	..
5 Sandal Working Circle	..	500
6 Minor Forest Produce Working Circle	75,750	500
7 Grazing Working Circle	46,133	..
8 Protection Working Circle	500	..
9 Miscellaneous items of revenue	48,960	..
10 Miscellaneous items of expenditure	..	31,500
11 Revenue realized by revenue authorities	55,430	..
12 Expenditure on establishment	..	3,11,888
13 Direction expenses	..	35,670
Total	..	**10,19,406**
Add Surplus for 10 years	..	2,97,316
Grand total	**13,16,722**	**13,16,722**

	RS.	A.	P.
1 The average annual revenue is expected to be	1,31,672	0	0
2 The average annual expenditure is expected to be	1,01,940	0	0
3 The average annual surplus is expected to be	29,732	0	0
4 Gross revenue per acre per annum	0	9	7
5 The management costs per acre per annum	0	7	3
6 The surplus per acre per annum	0	2	4
7 The percentage of expenditure to gross revenue	77·4 per cent.		

443. The net annual revenue expected is therefore about Rs. 29,732. The expected gross annual revenue of Rs. 1,31,672 works out to about Re. 0–9–7 per acre. The total annual management cost of Rs. 1,01,940 works out to about Re. 0–7–6 per acre. This leaves a net annual surplus of about Re. 0–2–4 per acre. The management costs are 77·4 per cent of the gross revenue; and of this expenditure, 34·2 per cent accounts for the cost of establishment.

444. Conditions in the immediate past have been abnormal and do not afford a true basis for comparison. During the six years 1927–28 to 1932-33 the average profit in working the division has been Rs. 27,172. Prior to this a higher profit was obtained due to the realization of revenue from tea lands, which now is credited to the Revenue department (paragraph 183). This average annual profit of Rs. 27,172 would have dwindled to Rs. 23,605 if allowance had been made for the cost of Direction establishment (paragraph 184). The greater surplus in the more immediate past 1931 and 1932, was due mainly to the high prices of sleepers which fetched an average profit of about Rs. 4–3–0 per broadgauge sleeper. (Paragraph 131.) In the forecast for the future the annual profit is expected to be Rs. 29,732. In this forecast an adequate allowance is made for the cost of direction and, further, the profit from the extraction of sleepers is reckoned at only Rs. 1–3–0 per broadguage unit, which latter circumstance alone accounts for a loss, as compared with the boom years, of about Rs. 36,000. In the proposals for future management provision has been made for regenerating exploited forests, which it is essential should be done but which nevertheless increases expenditure. Consequently the expansion in revenue which should result from the increased extraction of fuel and bamboos provided for in the proposals for future working, does not show an adequately enhanced surplus.

445. The following statement indicates the cost of the preparation of this working plan. It does not take into account a proportion of the cost of the Working Plans Circle establishment :—

Cost of the working plan.—The following statement shows the cost of the working plan till end of August 1934 :—

Item number and particulars. (1)	Amount. (2) RS.	A.	P.	Remarks. (3)
52-A. Working Plans.				
8 A. f.—				
1 Pay of officers—Non-voted	20,354	5	0	This excludes emergency cut in pay.
2 Pay of establishment—Voted	17,334	9	0	
c. Other Charges.				
3 Travelling allowances—Non-voted	3,064	15	0	
4 Travelling allowances—Voted	3,338	2	0	
5 Fixed travelling allowance	1,675	1	0	
6 Other compensatory allowances	723	11	0	
7 Contingencies	804	6	0	
8 Supplies and services	105	12	0	
9 *b.* Works	4,158	4	0	
Total ..	**51,559**	**1**	**0**	
Cost of working plan per acre	0	3	9	

A. N. SARMA,
Working Plans Officer No. V (Working Plans) Division, South Coimbatore.
18th September 1934.

C. C. WILSON,
Conservator of Forests, Working Plans Circle, Ootacamund.
19th September 1934.

CHAPTER XII.—SUMMARY OF PRESCRIPTIONS.

	Paragraph number and appendix.
1 The working plan covers an area of 344·6 square miles and includes all the reserves of the South Coimbatore Forest Division, except those included in the Mount Stuart Working Plan	1
2 The objects of management are protection, maintenance of a sustained annual yield of timber, fuel and bamboos for the needs of the people and the regeneration of the exploited forests by valuable species	191
3 The working circles formed are :— Selection Working Circle, Plantation Working Circle, Clear-felling Fuel Working Circle, Bamboo Working Circle, Sandal Propagation Working Circle, Minor Forest Produce Working Circle, Grazing Working Circle and Protection Working Circle	195
4 The *Selection Working Circle* has only one—the Kal-Ar—felling series, this being composed of the most accessible forests on the banks of the Kal-Ar river	197
5 The method of treatment is to extract mature trees by selection fellings on a girth limit, and to regenerate artificially such of the gaps as do not contain adequate natural regeneration	206
6 The felling cycle is ten years, and the minimum exploitable size is fixed at 7 feet B.H. girth. The rotation cannot now be fixed as the rate of growth of Mesua is not known	207, 208 & 209
7 The important timber species over the entire area of the felling series have been enumerated over alternate strips 2 chains wide, skipping 4 chains ..	201
8 The estimated stand of timber in ten coupes is given in a statement, and the coupes are indicated in a detailed map	204
9 The yield of sleepers from *Mesua ferrea* based on past data of conversion has been estimated and given in a statement	224
10 All *Mesua ferrea* trees of and above 7 feet in girth at breast height *may be felled*, but if species other than *Mesua ferrea* have a market, the extraction will be limited to three trees from each acre, a minimum distance of 60 feet between adjacent felled trees being imposed to avoid excessive fellings, unless two trees are so close together that they can be felled to form one gap	214
11 Coupe maps on a scale of 16 inches to one mile are to be made in January for extraction from the ensuing April	213
12 Marking of trees for extraction is to be done in the months of January and February by an officer not below the rank of Ranger, and at least 10 per cent of the marking is to be checked by a gazetted assistant	214
13 Rules for marking	214
14 Exploitation through the agency of contractors is advocated	215
15 Logging should be primarily for the conversion of broad gauge sleepers ..	217

		Paragraph number and appendix.
16	Mechanical haulage may be found to reduce costs of extraction. This question and the question of improvement of roads should be decided in consultation with the Forest Engineer	418 to 420
17	Regeneration prescriptions are provisional, and should be modified if found necessary, after consultation with the Provisional Sylviculturist	227
18	The species recommended for regeneration are *Acrocarpus fraxinifolius, Cedrela Toona, Dysoxylum malabaricum, Artocarpus hirsuta, Dipterocarpus bourdilloni*, and *Gluta travancorica*	228
19	Only gaps larger than 200 square yards and not containing adequate natural regeneration are to be artificially regenerated . The rules for selection of gaps are given	229
20	The District Forest Officer should personally inspect the gaps selected for regeneration and also a large number of those rejected	230
21	The gaps regenerated should be numbered	230
22	The centre of gaps should alone be regenerated	231
23	Extensive clearance of slash or brushwood is not recommended	232
24	An approximate spacing of 6 feet by 6 feet is recommended. The soil is to be worked over one foot square to a depth of 9 inches	233
25	Mainly dibbling of seeds is prescribed. Planting of seedlings may also be tried	234
26	Instructions for the formation of a nursery are given	235
27	Seeds should be collected from healthy middle-aged trees free from "twist."	237
28	It is estimated that annually about 400 gaps will have to be regenerated and about 25 patches in each gap will have to be prepared	238
29	The replacement of casualties is prescribed	249
30	Weedings in the first year should be in August or September. Weedings in the second year are also prescribed	250
31	Control book, control journal, record of works and regeneration ledger are prescribed	251
32	*Plantation Working Circle.*—The Plantation Working Circle is composed of the Old Punachi Working Circle	252
33	The growth in the working circle is deciduous, the important species being teak, *Dalbergia latifolia, Pterocarpus marsupium*, etc.	254
34	An area of 255 acres has been selected—designated Periodic Block I—for clear-felling and regeneration in the next ten years	256
35	A tabular statement of clear-fellings for the next ten years is given and the coupes are indicated in the detailed map	261 Appendix II.
36	The rest of the area—designated Periodic Block II has not been divided into clear-felling coupes now	257
37	The annual clear-felling coupe of about 25 acres is to be sold standing to a contractor, and about Rs. 30 per acre is obtainable	261
38	The rotation is not now fixed definitely	262
39	The planting will be carried out with the help of field crops on the "Podu system" as it is economical	263 & 264
40	The clear-felling coupe is to be sold to the contractor in December, and his work is to expire in one year from January. Essential conditions attached to the clear-felling are incorporated	266
41	After the contractor quits the coupe, the land is to be parcelled to the jungle tribes in January, on an agreement, sample for which is given	267 Appendix III.
42	Before the end of March the clearing and burning is to be completed ..	268
43	The uprootal of lantana is to be made thoroughly	269
44	In the event of unforeseen failure of Podu system, the system will have to be carried out departmentally	270
45	Mainly teak, *Dalbergia latifolia, Pterocarpus marsupium* are to be planted. As an experiment *Artocarpus hirsuta* is prescribed for planting over about one acre a year for three years	271
46	A coupe map on a scale of 16 inches to one mile is to be prepared and maintained	272
47	A spacing of 6 feet by 6 feet is prescribed. As an experiment with a view to studying the effect of closer spacing on the suppression of lantana, a spacing of 3 feet by 3 feet is prescribed over one acre a year	273
48	Stumps are to be planted in crow-bar holes	275
49	The distribution of the species is left to the discretion of the District Forest Officer	276
50	Teak, *Dalbergia latifolia* and *Artocarpus hirsuta* are to be planted as stumps and the rest may either be planted as stumps or seeds dibbled in prepared patches	279

	Paragraph number and appendix.
51 Experimentally *Artocarpus hirsuta* is to be planted in mixture with teak alternately over one acre a year	277
52 Instructions for the opening and maintenance of a nursery are incorporated.	281
53 The quantities of seed required are estimated	282
54 Early planting is definitely prescribed	285
55 Replacement of casualties is to be made	288
56 Weeding in the first year is to be entirely done free of cost by the cultivator ..	289
57 Second year weeding and soil forking or scraping is to be done by the department, before the commencement of the monsoon in May	290
58 Weeding in succeeding years is left to the discretion of the District Forest Officer	291
59 Thinning in the fifth year is recommended	292
60 In Periodic Block II selection fellings of mature and marketable trees are prescribed	295
61 The rules for marking trees for selection fellings	297
62 The marking is to be done only for obtaining 12,500 cubic feet of timber, and the order in which the compartments are to be taken up for marking is indicated	295 & 296
63 Extraction is to be mainly through the agency of contractors, failing which departmental operations are contemplated	298
64 Tending measures for improving regeneration are prescribed over the selection felled areas	299
65 In six gaps, an experiment of preventing the invasion of lantana with the help of Tephrosia candida is prescribed for three years	300 & 301
66 Thinning and tending for old plantations and regeneration areas is prescribed.	302
67 The forest is closed to grazing except for the cattle resident at Attikatti subject to a limit of 30 heads of cattle on a fee of Rs. 2–8–0 each	303
68 The fire-protection measures and maintenance of fire lines are prescribed ..	304
69 A control book, control journal, regeneration ledger with map, and record of works are prescribed for the working circle	310
70 The *Fuel Working Circle* has an area of about 21,200 acres. It is divided into 12 felling series	311
71 The system of treatment is simple coppice. Regeneration is to be augmented by sowing seeds of valuable species on burnt rab lines.	316
72 A rotation of 30 years is prescribed for five felling series and 40 years for the remaining seven felling series	317
73 Yield is regulated by area, annual coupes being indicated in a statement and in the maps	320
74 Exploitation through the agency of contractors is prescribed	322
75 Clear-felling of indicator areas to determine the yield is not insisted upon : discretion is left to the District Forest Officer to decide if it is necessary ..	323
76 The survey of coupes is to be done in January, and the coupes suitably divided into not more than four strips	324
77 A diagrammatic sketch of the coupe is to be maintained to indicate the lay-out of the strips, and of the rab lines	325
78 Coupes are to be sold and conveyed to the purchaser before the 1st April ..	326
79 The rules for felling are elaborated	327
80 The order of felling the coupes with their areas is given in a statement and in detailed maps : but accurate areas are to be arrived at after survey each year	329
	Appendix II.
81 The debris heaped in lines about 9 feet wide, and at about 40 feet intervals, interrupted wherever necessary, is to be burnt in two instalments—once in August-September before the north-east monsoon, and again over the rest of the area in April-May before the south-west monsoon	332
82 Immediately after the burn the soil is to be raked to mix it with the ash ..	333
83 The soil is to be worked over patches two feet square and six inches deep, spaced every three feet on either side of a line along the centre of the burnt rab line. These patches are to be indicated by stakes	333
84 At each stake a mixture of the seeds selected by the District Forest Officer is to be sown	334
85 A list of the species recommended for sowing is given	342
86 The best time for sowing is to be determined by the District Forest Officer in consultation with the Provincial Sylviculturist	334
87 Extensive failure in germination should be treated by re-sowing in the succeeding season	335
88 In parts of Keerapadi and Kottur fuel series, planting of teak prescribed in localities determined by the District Forest Officer to be suitable for the species	336
89 Should there be a demand for land for cultivation it is suggested that the regeneration of fuel coupes with the help of field crops be tried	340

		Paragraph number and appendix.
90	Weedings are not prescribed. It is left to the District Forest Officer to determine whether any such weeding as may be necessary would be financially justifiable, and if so to undertake it	343
91	The cost of rab regeneration is estimated at about Rs. 1–8–0 per acre ..	345
92	Worked coupes are to be demarcated by stones, with coupe numbers and years engraved on them	346
93	Worked coupes are to be closed to grazing for a period of ten years	347
94	A list of paths passing through the Fuel Working Circle is given and the cost of fire-tracing these paths is estimated. The District Forest Officer is to decide annually which of these paths require to be fire-protected before sanctioning estimates	348
95	A control book, control journal, regeneration ledger and record of works are prescribed for the Fuel Working Circle	350
96	The *Bamboo Working Circle* has an area of 63,104 acres	351
97	There are 11 felling series in the working circle, each having three coupes, the boundaries of which are indicated in a statement, and in the management map	351 Appendix II.
98	The method of treatment is selection thinnings, on a three-year felling cycle.	353
99	Exploitation through the agency of contractors is prescribed	359
100	Coupes are to be sold in March, and conveyed to the purchaser before April	360
101	Felling rules to be insisted on are given	361
102	No special fire-protection measures are prescribed	364
103	A control book is prescribed for the working circle	365
104	The *Sandal Propagation Working Circle* lies entirely in Udamalpet range ..	366
105	The Range Officer is to select the propagation centres himself till the beat guard is able to select suitable centres	370
106	Rules for the selection of propagation centres are given	370
107	In each of the ten beats of the range, five propagation centres are to be selected annually, making 50 propagation centres every year	371
108	The propagation centres are to be about 10 feet in diameter, to be cleared of growth and burnt in February without injuring the neighbouring trees, and are to be fenced	371
109	Each centre is to be staked at an espacement of 3 feet by 3 feet where the seeds are to be sown, covered over with straw, etc., and watered. The time of sowing is to be May; it may be altered if found necessary by experience.	372, 373
110	Casualties are to be replaced in September, and in the succeeding year in May and September, for which seedlings grown in bamboo baskets may also be tried	374
111	To provide temporary hosts, *Cajanus indicus* is to be broadcast over the area	375
112	Weeding and tending is to be done with care, retaining hosts for the sandal.	376
113	In the old established sandal areas tending is to be done when found necessary by the District Forest Officer	377
114	Seed is to be covered over with cages of small gauge wire netting, if much of it is destroyed by vermin	378
115	An amount of Rs. 50 for the fifty propagation centres is estimated for labour costs	379
116	A sandal propagation journal with a map showing the location of the propagation centres is prescribed	380
117	The *Minor Forest Produce Working Circle* covers the entire area of 344·6 square miles	381
118	The items of produce collected are given in a statement	382
119	The system of collection through the agency of contractors is to be generally adopted	384
120	Ivory and horns are to be collected departmentally, and sold by the District Forest Officer	385
121	The right to collect fruits of *Terminalia chebula* is to be sold separately in three units—Udamalpet range, Pollachi range, and Punachi and Ulandi ranges combined	386
122	The right to collect bark of *Cassia fistula* is to be sold on a rotation of five years in the manner indicated, one range at a time	387
123	The right to collect the bark of *Cassia auriculata* is to be sold for Udamalpet range only as the produce does not exist elsewhere	389
124	The right to collect the other items of minor forest produce is to be sold in three units—Udamalpet range, Pollachi range, and Punachi and Ulandi ranges combined	390
125	The lease of all items of minor forest produce shall be for a year from 1st July	391
126	A control book is prescribed for the working circle. The quantities collected should be ascertained accurately	392

		Paragraph number and appendix.
127	The *Grazing Working Circle* consists of the whole of Punachi, and Udamalpet ranges, and the Torakadavu block transferred from Pollachi to Punachi range	393
128	Goats are to be excluded, but other animals are to be allowed to graze at the existing approved rates	396
129	Penning shall be free. Existing pens are given in a list, but they may be varied with the approval of the Coimbatore Conservator. No pens are to be allowed within half a mile of the Fuel Working Circle boundary ..	398
130	Should forests be burnt and growth damaged by fires, the District Forest Officer may as a silvicultural measure close up to a limit of a thousand acres, on his own authority, subject to report to the Collector for approval.	400
131	A control book is prescribed	401
132	The *Protection Working Circle* has an area of about 212·9 square miles. It includes the area set apart for Cinchona plantations	402
133	Enumeration of *Mesua ferrea* where it exists was undertaken. The stand and yield of broad-gauge sleepers is estimated and given in a statement. ..	405
134	When *Mesua ferrea* sleepers are saleable, they may be extracted first from Iyerpadi, the most accessible area	407
135	When demand for shola timber arises, it may also be met from the Iyerpadi shola	407
136	If and when certain sholas north of the Savamalai estates are assigned, and made more accessible, *Mesua ferrea* sleepers, as estimated in the statement in paragraph 408-A, may be extracted	408
137	The District Forest Officer should restrict shifting cultivation as much as possible	410
138	Agricultural implements may be allowed to be removed on permits, from the area set apart for shifting cultivation at Pundi	411
139	Demand for dry fuel for cooking at temple festivals is to be provided for ..	412
140	Early burning of the grass hills is to be done	413
141	Experiments to watch natural extension of sholas may be initiated	413
142	*Miscellaneous prescriptions and regulations.* The Forest Engineer is to be consulted in regard to mechanical haulage of sleepers or the improvement of the road in the Kal-Ar valley	418 to 420
143	All existing roads and paths are to be maintained	421
144	The Chinnar-Thalinji road and the Villoni ghat road are proposed for construction	423 to 426
145	Contractors may be given leases of several coupes at a time to allow them to make their own extraction paths or roads	428
146	Fire-reports are to be scrutinized and a fire-map maintained	430, 431
147	Existing buildings are to be maintained	432
148	Should sleeper extraction be undertaken an increase of staff will be necessary.	433
149	For purchase of stores and tools for regeneration, a capital expense of Rs. 1,500 is estimated	436
150	In preparing and checking the control returns the following points require special attention :	
151	Coupe maps on a scale of 16 inches to one mile are to be prepared	213
	Marking rules for *Mesua ferrea* and for other species are different	214
	Extract of fellings showing unsoundness, yield, etc., are to be submitted ..	222
	Consult Provincial Silviculturist about artificial regeneration	227
	Observance of rules for selection and rejection of gaps is to be checked ..	229 and 230
	Espacement, soil working, staking, dibbling and planting is to be ckecked. ..	233, 231, 234
	Replacement of casualties, if casualties exceed 25 per cent is to be made. ..	248
	Consult Provincial Silviculturist about stump planting	249
152	*The Plantation Working Circle.*—Demarcation and sale of the coupe in December, with a year's voidah	266
	The contractor to keep a brake pole depot at Attikatti	266
	Land is to be assigned to local Pulayars preferably	267
	Coupe map on a scale of 16 inches to one mile is to be prepared	272
	A spacing of 6 feet by 6 feet is prescribed	273
	Experimentally espacement of 3 feet by 3 feet is prescribed over one acre for two years, to study suppression of lantana	273
	Provincial Silviculturist is to be consulted about stump planting	275
	Experimentally over one acre a year, for three successive years, *Artocarpus hirsuta* is to be planted alternately with teak in each row	277
	If Provincial Silviculturist's experiments show that it is advisable, *Pterocarpus marsupium* may be planted as stumps. Regarding *Artocarpus hirsuta*, Provincial Silviculturist is to be consulted.	279
	Casualties are to be replaced when they are noticed	288
	Weeding in the first year to be free of cost by the cultivators	289
	Second year weeding and soil forking to be done in May	290

		Paragraph number and appendix.
	Thinning in the fifth year is suggested	292
	Selection felling to be confined to Periodic Block II and to 12,500 cubic feet annually	295
	The sequence of compartments to be maintained in marking for selection felling	296
	Tending in the selection felled areas in the year following the felling is to be done	299
	Experimentally six gaps caused by selection fellings are to be planted up with a protective fence of *Tephrosia candida*, each year for three years: its continuance is to be considered in consultation with the Provincial Silviculturist	300 and 301
	Thinning and tending of plantations and old regeneration areas is to be watched	302
	Grazing is allowed in compartment 1 for 30 head of cattle at Rs. 2–8–0 each	303
	Fire protection by clearing and burning fire lines	304 and 305
	Boards indicating compartment numbers to be maintained	308
153	*The Fuel Working Circle.*—Felling through contractors only	322
	Coupes to be demarcated in January and sold and conveyed before March	324
	Diagrammatic sketch of the coupe showing rab lines to be maintained	325
	Contractors to have a year's voidah: but should deliver half of the coupe before the end of August	326
	Regeneration of each coupe is to be in two instalments every year	332
	Consult the Provincial Silviculturist about the best time of sowing	334
	Planting of teak in some coupes of two felling series is to be done	336
	Consult the Provincial Silviculturist periodically about the general question of rab sowing	339
	District Forest Officer should endeavour to regenerate fuel coupes with the help of field crops	340
	Worked coupes are closed to grazing for ten years	347
	Fire tracing certain important paths is indicated	348
154	*The Bamboo Working Circle.*—Coupes to be sold in March with a year's voidah, to contractors	361
	Arrear coupes may be sold in addition to the year's coupe on the Conservator's discretion	362
155	*The Sandal Propagation Working Circle.*—The Range Officer is to select the first few propagation centres instructing the beat staff how to select them.	370
	Five propagation centres for each of the ten beats every year are to be selected	371
	Spacing is to be 3 feet by 3 feet	372
	Casualties are to be replaced in the two seasons even in the second year	374
	Weeding and tending to be done with care	376
	Old established sandal areas should be inspected by the District Forest Officer and he should have tending carried out wherever necessary	377
156	*The Minor Forest Produce Working Circle.*—Ivory and horns to be collected and sold departmentally	385
	Terminalia chebula is to be sold separately in three units	386
	Cassia fistula is to be sold, each range separately, once in five years	387
	Cassia auriculata is to be sold for Udamalpet range only	389
	Other minor forest produce to be sold together	390
	All minor forest produce is to be sold for a year from 1st July	391
157	*The Grazing Working Circle.*—Grazing is to be on permits at standard rates, except for compartment 1 of the Plantation Working Circle	396
	Penning is to be free at approved pens. List of pens is given, and can be added on with the approval of the Coimbatore Conservator.	398
	Burnt areas up to a limit of 1,000 acres can be closed for grazing by the District Forest Officer subject to approval by the Collector	400
158	*The Protection Working Circle.*—Extraction of sleepers from the Iyerpadi block being cheaper can be done at the earliest opportunity	407
	If areas north of Savamalai are opened up for tea planting, sleepers may be extracted	408
	Agricultural implements may be removed from the area set apart for shifting cultivation at Pundi	411
	Dry fuel for consumption at temples is to be provided for from the reserve.	412
	Early burning of the grass hills	413
	Shola extension experiments may be initiated	413
	Abolition of Attikatti game sanctuary	415
159	*Miscellaneous regulations.*—Mechanical haulage of sleepers and improvement to roads is to be considered with the Forest Engineer	420
	New roads to be opened—Chinnar-Thalinji and Villoni	423
	Fire reports to be scrutinized and fire-maps to be maintained	430

OFFICE OF THE CHIEF

APPENDIX I.

Consists of the following records—

1. Original enumeration sheets filed with the records of the Working Plan Division.

Kal-Ar valley.

(Area set apart for Cinchona plantation.)

A	Base line east	....	24	Sheets.
A	Base line east	Check enumeration sheets	5	,,
A	Base line west	....	30	,,
A	Base line west	Check enumeration sheets	4	,,
A[1]	Base line east	....	15	,,
A[1]	Base line east	Check enumeration sheets	1	,,
B	Base line north	....	40	,,
B	Base line north	Check enumeration sheets	9	,,
B	Base line south	Enumeration sheets	27	,,
B	Base line south	Check enumeration sheets	6	,,
B[1]	Base line east and west ..	....	15	,,
B[1]	Base line east	Check enumeration sheets	3	,,
C	Base line south	Enumeration sheets	58	,,
C	Base line south	Check enumeration sheets	6	,,
C[1]	Base line west	....	11	,,
C[1]	Base line west	Check enumeration sheets	4	,,
D	Base line east	....	25	,,
D	Base line east	Check enumeration sheets	7	,,
D	Base line west	....	41	,,
D	Best line west	Check enumeration sheets	10	,,

Iyerpadi Block.

E	Base line north	....	7	Sheets.
E	Base line north	Check enumeration sheets	2	,,
E	Base line south	....	25	,,
E	Base line south	Check enumeration sheets	4	,,
E[1]	Base line east and west ..	....	6	,,

Villoni Block.

Villoni bridle-path as base line.	Enumeration sheets	35	Sheets.
Villoni bridle-path as base line.	Check enumeration sheets	3	,,

Savamalai Block.

Savamalai block trial strips ..	Enumeration sheets	16	Sheets.

Sheikalmudi Block.

Reserve boundary as base line.	Enumeration sheets	27	Sheets.
Reserve boundary as base line.	Check enumeration sheets	4	,,

Kal-Ar valley.

A	Base line 4-chain strip enumeration sheets	35	Sheets.
D	Base line 4-chain strip enumeration sheets, 1931–32 felling area gap enumeration	10	,,

Ayerpadi Block.

E	Base line seedling enumeration	5	Sheets.

2. A copy of the enumeration sheets in bound books, supplied to the District Forest Officer (Volumes I to IV).

3. An abstract of the results of enumeration in bound books, Volumes V and VI and one file of Printed Enumeration Sheets, Volume VII.

APPENDIX II.

Maps.

The following maps have been prepared to accompany the working plan. One complete set of each of the maps is filed with the records in the office of the Conservator of Forests, Working Plans Circle ; also the following officers have been supplied with a set of maps :—

(1) The Chief Conservator of Forests—one set.
(2) Conservator of Forests, Coimbatore Circle—one set.
(3) The District Forest Officer, Coimbatore South—one set.

List of maps.

1. Combined stock and management map on a scale of 1 inch = 2 miles, showing vegetational types, and working circles, prepared from sheet Nos. 58 B/14, 58 B/15, 58 B/16, 58 F/2, 58 F/3, 58 F/4, 58 F/7 and 58 F/8—To be printed with the working plan.

2. Detailed maps on a scale of 4 inches to 1 mile showing—

(i) *Selection Working Circle* (one sheet)—Anamalai reserve—showing the ten coupes to be worked for ten years.

(ii) *Plantation Working Circle* (one sheet)—Punachi and Anamalai reserves—showing the twenty compartments and the annual coupes to be clear-felled and planted during the ten years (one sheet).

(iii) *Fuel Working Circle* (five sheets)—(*a*) Pothamadai, Keerapadi, Gudaravalli, Ayerangal and Pachathanni series—Tunakadavu and Anamalai reserves—showing the division of annual coupes and table of fellings.

(*b*) Kottur Fuel Felling Series—Anamalai reserve—showing the division of annual coupes and table of fellings.

(*c*) Nal-Ar Fuel Felling Series—Anamalai reserve—showing the division of annual coupes and table of fellings.

(*d*) Dhali Fuel Felling Series—Anamalai and Dhali reserves—showing the division of annual coupes and table of fellings.

(*e*) Chinnar Fuel Felling Series—Amaravati reserve.

Kamanuthu and Amaravati Fuel Felling Series.

Anamalai and Amaravati reserves.

Navalodai Fuel Felling Series—Anamalai reserve—showing the division of annual coupes and table of fellings.

APPENDIX III.

Forest department—Agreement for 'Shifting' Cultivation.

AGREEMENT entered into this day of between (hereinafter called the lessee) on the one part and the District Forest Officer, Coimbatore South (hereinafter called the lessor) acting for and on behalf of the Secretary of State for India in Council on the other part.

Whereas the lessee having applied for a few acres of land in Punachi reserve to carry on 'Shifting' cultivation under the supervision of the Forest department, and whereas the lessor has sanctioned the request for the land (hereinafter called the plot) in the Coimbatore South District Forest Officer's dated subject to the conditions hereinafter set forth, and whereas the lessor has paid the sum of Rs. for acres calculated at Rs. per acre of the plot. Now these Presents Witness that for the carrying out of the said lease into execution the lessee and the lessor do hereby contract that the said lease shall be subject to the conditions mentioned below :—

(1) The lessee shall obtain a sketch of the plot and a copy of this agreement signed by the lessor in token of his entry into the land and be shown the boundary of the plot.

(2) Possession of the said plot shall be given to the lessee in the condition in which it now is, and the lease shall expire on .

(3) The lessee must cut flush with the ground or uproot all standing growth on the plot, and shall burn the material before , and any time thereafter he shall sow, weed and harvest a single crop of ragi or other annual .

(4) The lessee shall cultivate the whole of the plot and leave no patch uncultivated.

(5) The lessee shall not sublet or mortgage his rights under this lease, and the lessor shall not be bound to recognize any transference of his rights under this lease.

(6) The lessee may erect temporary sheds for his residence and for watching and storing his crops and such sheds shall be located with the consent of the lessor. Such sheds shall not exceed an area of 24 feet × 24 feet.

(7) The lessee and other persons brought in by him to his plot shall at all times obey the rules of the Forest department, and instructions for the protection of the reserve issued by the lessor.

(8) The lessor reserves to himself and to all persons authorized by him the right to enter the plot at any time for the improvement of the trees planted on the area.

(9) The lessee shall be bound to provide labour for the lessor in preparation of the plot and for planting of the trees. For labour so provided the lessee shall be paid at the rate of as per days labour per man, per woman coolie and per child.

(10) The lessee shall watch and protect the trees planted in the plot and keep them free of weeds until the crop is reaped as directed by the lessor or his agent from time to time. He shall weed around the plants as often as he weeds the paddy, free of cost. When harvesting his crop, the lessee shall pull up all paddy and weeds for a radius of 18 inches around each plant, shake the soil from the roots back in its place and lay the uprooted weeds below the plant.

(11) The lessor may for unsatisfactory observance of the conditions of the lease cancel the lease and instruct the lessee to quit the plot. In such a case the lessor's decision shall be final.

(12) The lessee will be entitled to no compensation for any improvements he may have effected on the plot, and all his rights shall terminate with the termination of the lease.

In witness whereof the lessee and lessor have hereunto set their hands this day.

APPENDIX IV (a)

List of flora.

Botanical name.	English name.	Tamil name.
Abrus precatorius	....	Kundumani.
Acacia arabica	....	Karuvelam.
Acacia concinna	....	Seekai.
Acacia ferruginea	....	Parambai.
Acacia Intsia	....	Kar Indu.
Acacia Latronum	....	Odai.
Acacia leucophloea	....	Velvelam.
Acacia pennata	....	Vella Indu.
Acalypha fruticosa	....	Sinni.
Acrocarpus fraxinifolius	....	Mala Konnai.
Acronychia laurifolia	....	....
Actinodaphne Hookeri	....	Thali.
Adina cordifolia	....	Manjakadambai.
Aglaia Roxburghiana	....	Chokala.
Aglaia travancorica	....	....
Agrostistachys indica	....	Mancharei.
Ailanthus excelsa	....	Periyamaram or **Peemaram.**
Ailanthus malabarica	....	Mattipal.
Albizzia amara	....	Unjal.
Albizzia Lebbek	....	Vagai.
Albizzia odoratissima	....	Selavagai.
Albizzia stipulata	....	Pulivagai.
Allophylus Cobbe	....	....
Alsodeia zeylanica	....	....
Alstonia scholaris	....	Elalai palai.
Amoora canarana	....	Karagil.
Amoora Rohituka	....	....
Anogeissus latifolia	....	Vekkali.
Anthocephalus cadamba	....	....
Antiaris toxicaria	....	Alli.
Antidesma Menasu	....	....
Aphania bifoliolata	....	Semblichi.
Aporosa Lindleyana	....	Vittil.
Arenga Wightii	....	Alampanei.
Aristolochia Roxburghiana	....	....
Artocarpus hirsuta	....	Anjili (Aynipila).
Artocarpus integrifolia	Jack tree	Pila.
Artocarpus Lakoocha	....	....
Asparagus racemosus	....	....
Atalantia monophylla	....	Katta elumichum.
Azadirachta indica	Margosa	Veppam.
Balsamodendron Berryi	....	Mulkiluvai.
Bambusa arundinacea	Bamboos	Moongil.
Bauhinia phoenicea	....	....
Bauhinia racemosa	....	Aathi.
Beilschmiedia bourdilloni	....	....
Beilschmiedia Wightii	....	....
Bischofia javanica	....	Chelavenga.
Bombax malabaricum	Cotton tree	Ilavu (Poola).
Bridelia retusa	....	Mul vengai.
Buchanania latifolia	....	Morala, Sarai.
Calamus pseudotenuis	Canes	Chinna perambu.
Calamus Rheedii	Do.	Kattu perambu.
Calamus travancoricus	Do.	Man perambu.
Calophyllum elatum	Poonspar tree	Srikonnai.
Calophyllum tomentosum	Do.	Do.
Calotropis gigantea	....	Erukkali.
Capparis grandiflora	....	Thorattimul
Canarium strictum	Black dammer tree	Kundrikam.
Canthium didymum	....	Sulunthu.
Canthium parviflorum	....	Nallakarai.
Carallia lucida	....	Varanga.
Careya arborea	....	Ayama.
Carissa carandas	....	Kilakkai.
Cassia auriculata	....	Avaram.
Cassia Fistula	The Indian laburnum	Konnai.
Cassia montana	....	Konnu avaram.
Cedrela Toona	Red cedar	Chukannakil.
Chuckrassia tabularis	Chittagong tree	Agil.
Chloroxylon Swietenia	....	**Porasu.**
Chomelia asiatica	....	Therani.

List of flora—cont.

Botanical name.	English name.	Tamil name.
Chrysophyllum Roxburghii	The star apple	Katt iluppa.
Cinnamomum sulphuratum	....	....
Cinnamomum zeylanicum	Cinnamon tree	Karuva.
Clausena Willdenowii	....	Kat veppilai.
Clerodendron infortunatum	....	Perugilei.
Cleistanthus collinus	....	Oddamaram.
Cochlospermum gossypium	....	Thanakku.
Cordia fulvosa	....	Narivirium.
Cordia Myxa	....	Virusham.
Crataeva religiosa	....	Mavelingam.
Croton malabaricus	....	....
Cryptocarya amygdalina	....	....
Cullenia excelsa	....	Vedipla.
Curcuma spp.	....	Kattukuvai.
Dalbergia latifolia	Rosewood	Itti.
Dalbergia paniculata	....	Pachali.
Dalbergia sissoides	....	....
Daphniphyllum glaucescens	....	Soluvam.
Dendrocalamus Brandisii	....	Mungil.
Dendrocalamus longispathus	....	....
Dendrocalamus strictus	Male bamboo	Kal moongil.
Derris scandens	....	....
Desmodium pulchellum	....	....
Dichopsis elliptica	....	Pali.
Dichrostachys cinerea	....	Vedathala.
Dillenia pentagyna	....	Punnai.
Diospyros affinis	....	Vakkana.
Dodonaea viscosa	....	Virali.
Dolichandrone falcata	....	Kalar Athi.
Dysoxylum malabaricum	White cedar	Vellagil.
Dysoxylum purpureum	....	Karagil.
Elaeocarpus ferrugineus	....	....
Elaeocarpus Munroii	....	....
Elaeocarpus oblongus	....	Khatta karei.
Elaeocarpus serratus	....	Karei.
Elaeocarpus tuberculatus	....	Ruthracham.
Elaeodendron gloucum	....	Karukuva (Cilupa).
Elettaria cardamomum	Cardamom	Elam.
Entada scandens	....	....
Eriodendron anfractuosum	....	Seemapoola.
Erythroxylon monogynum	....	....
Eugenia argentea	....	Naval.
Eugenia hemisphaerica	....	....
Eugenia jambolana	....	Naval.
Eugenia laeta	....	....
Eugenia malabarica	....	....
Eugenia Munronii	....	....
Eugenia wynadensis	....	....
Eugenia zeylanica	....	....
Euphorbia antiquorum	....	Thirukukalli.
Ficus bengalensis	Banian tree	Alamaram.
Ficus glomerata	....	Athi, Ichimaram.
Ficus hispida	....	Chara, Athi or Ottanali.
Ficus retusa	....	Kolichi.
Ficus tomentosa	....	Kattarasu.
Ficus Tsiela	....	Ichi.
Filicium dicipiens	....	Ningal.
Fluggea Leucopyrus	....	Veppula.
Fluggea microcarpa	....	Poola.
Garçinia Cambogia	....	Kodukkapuli.
Gardenia gummifera	....	Kambali pision.
Gardenia echinocarpa	....	....
Gardenia morella	....	Makki.
Garuga pinnata	....	....
Givotia rottleriformis	....	Boothali.
Glochidion malabaricum	....	....
Glochidion rigidum	....	....
Glycosmis pentaphylla	....	Kulapanei.
Gmelina arborea	....	Kumil.
Gmelina asiatica	....	Kumilamchedi.
Gnetum scandens	....	....
Gomphandra polymorpha	....	....

List of flora—cont.

Botanical name.	English name.	Tamil name.
Goniothalamus cardiopetalus ..	....	....
Gordonia obtusa	....	....
Grewia asiatica	....	Unnu.
Grewia orientalis	....	Do.
Grewia tiliæfolia	....	Thadachi.
Gyrocarpus americanus	....	Vellathanuku.
Gyrocarpus jacquini	....	Do.
Hardwickia binata	....	Acha.
Hardwickia pinnata	....	Madayan sampirani.
Helicteres isora	....	Kaiva or Valamburi.
Hemicyclia elata	....	Vellelembu.
Hemicyclia sepiaria	....	Do.
Heptapleurum stellatum	....	....
Heritiera papilio	....	Chatanangu.
Heynea trijuga	....	....
Hiptage Madablota	....	Vennalankodi.
Holigarna Arnottiana	....	Kattu cheru.
Holigarna Grahamii	....	....
Homalium zeylanicum	....	....
Hopea parviflora	Iron wood	Erumpakam.
Hugonia mystax	....	....
Hydnocarpus Wightiana	....	Maravetti.
Hymenodictyon excelsum	....	....
Ilex spp.	....	....
Ixora parviflora	....	Shulundu (Kora).
Jatropha curcas	....	....
Kurrimia indica	....	....
Lagerstrœmia Flos Reginae ..	....	Pumaruthu.
Lagerstrœmia lanceolata	....	Venteak.
Lansium anamalayanum	....	Santhana viri.
Lantana camara	Lantana.	Arippu.
Laportea crenulata	....	Ottapilavu (Anachoriyan).
Leea sambucina	....	..
Limonia acidissima	....	Narivela, Naivela.
Linociera malabarica	....	....
Litsœa Stocksii	....	....
Litsœa Wightiana	....	....
Loranthus	....	Ethukanni.
Macaranga peltata	....	Vatta.
Macaranga Roxburghii	....	Do.
Machilus macrantha	....	Kolamavu.
Mœsa indica	....	....
Mallotus philippinensis	....	Kapila.
Mangifera indica	Mango tree	Mamaram.
Mappia fœtida	....	Arali.
Mastixia arborea	....	....
Melastoma malabathricum ..	....	....
Melia dubia	....	Mala vembu.
Meliosma arnottiana	....	Huli makay, kusavi.
Meliosma simplicifolia	....	....
Memecylon edule	....	Kassan or Kayan.
Memecylon malabaricum	....	....
Mesua ferrea	....	Nangul (suruli).
Mimusops hexandra	....	Karumpaali.
Morinda citrifolia	....	Noona.
Moringa pterygosperma	....	Kattumurings.
Mundulea suberosa	....	Karu avarai or pil avarai.
Mussœnda frondosa	....	....
Myristica attenuata	....	Chorapanu.
Myristica canarica	....	....
Myristica laurifolia	....	Jathika.
Myristica malabarica	....	Katjathika.
Nephelium longana	....	Kattu poovam or shenpuvam.
Nothopegia Colebrookiana	....	Sorapalai.
Ochlandra Beddomei	....	Eta.
Ochlandra Rheedii	....	..
Ochlandra travancorica	....	Iral, Itakalli.
Odina wodier	....	Udi, Uthi, Kaka usil.
Olea dioica	....	Koli payar.
Opuntia Dillenii	....	Sapa-thukalli.
Ostodes zeylanica	....	....
Pajaia rheedii	....	....

List of flora—cont.

Botanical name.	English name.	Tamil name.
Pandanus furcatus	....	....
Paramignya armata	....	....
Pavetta hispidula	....	Pavetta.
Photinia Notoniana	....	....
Phyllanthus Emblica	....	Nellikkai.
Pinanga Dicksonii	....	Kana Kamuku.
Piper nigrum	....	Milaku.
Pithecolobium anamallayanum	....	...
Plumeria acutifolia	....	Alai.
Pœciloneuron indicum	....	Vazal.
Polyalthia cerasoides	....	Nedunar.
Polyalthia coffeoides	....	Nakuloi.
Polyalthia fragrans	....	Nedunar.
Premna integrifolia	....	Minnai.
Premna tomentosa	....	Kolakattai.
Protium caudatum	....	Kiluvai
Pterocarpus marsupium	....	Vengai.
Pterolobium indicum	....	Sigappu Indu.
Pterospermum rubiginosum	....	Chinna polavu.
Putranjiva Roxburghii	....	Kamppalai.
Pygeum Wightianum	....	Attanari Kongu.
Randia dumetorum	....	Malukkarai.
Randia malabaricum	....	Sirukarai.
Sapindus emarginatus	....	Poochakottai.
Sapindus trifoliatus	....	Do.
Sarcococca pruniformis	....	....
Schleichera trijuga	....	Poovam.
Semecarpus anacardium	....	Sherankottai.
Spatholobus purpureus	....	....
Spondias mangifera	....	Katampalam.
Stephegyne parvifolia	....	Nirkadamba.
Sterculia alata	....	Aneithondi.
Sterculia fœtida	....	Pinari.
Sterculia guttata	....	Kawili, Thondi.
Sterculia villosa	....	Murutthan.
Stereospermum chelonoides	....	Poopathiri.
Stereospermum suaveolens	....	....
Stereospermum xylocarpum	....	Pathiri.
Strobilanthes barbatus	....	Kurinji.
Strobilanthes perfoliatus	....	Do.
Strychnos Nux-vomica	....	Yetti.
Strychnos potatorum	....	Thattan.
Swietenia macrophylla	....	....
Symplocos spicata	....	....
Tectona grandis	....	Tekku.
Terminalia Arjuna	....	Mathi or Kolmarudu.
Terminalia bellerica	....	Thani.
Terminalia chebula	....	Kadukkai.
Terminalia paniculata	....	Vellamamdu or Pilla marudu.
Terminalia tomentosa	....	Karimarudu.
Tetrameles nudiflora	....	Chini.
Thespesia populnea	Portia tree	Poovarasu.
Thunbergia mysorensis	....	....
Toddalia bilocularis	....	....
Trema orientalis	....	Anaparuthi.
Trewia nudiflora	....	....
Vateria indica	....	Vellakuntrikam.
Vatica Roxburghiana	....	....
Ventilago madraspatana	....	Vembadam.
Vernonia arborea	....	....
Vitex altissima	....	Maila.
Vitis quadrangularis	....	Parandai.
Walsura piscidia	....	Valsura.
Webera corymbosa	....	Papatan.
Wendlandia notoniana	....	Thovarai.
Wrightia tinctoria	....	Palai.
Xylia xylocarpa	....	Irool.
Zanthoxylum Rhetsa	....	Kattumurukku.
Zizyphus Jujuba	....	Yelandai.
Zizyphus Oenoplia	....	Surai.
Zizyphus xylocarpa	....	Mulkottai.
Zizyphus Xylopyrus	....	Kottai.

APPENDIX IV (*b*).

Tamil name.	English name.	Botamical name.
Acha	....	*Hardwickia binata.*
Agil	Chittagong tree	*Chuckrassia tabularis.*
Alai	....	*Plumeria acutifolia.*
Alamaram	Banian tree	*Ficus Begalensis.*
Alampanei	....	*Arenga Wightii.*
Alangi	....	*Elæocarpus serratus.*
Anachoriyan	....	*Laportea crenulata.*
Anaparuthi	....	*Trema orientalis.*
Aneithondi	....	*Sterculia alata.*
Anjili	....	*Artocarpus hirsuta.*
Arali	....	*Mappia fœtida.*
Aranthalli	....	*Antiaris toxicaria.*
Arippu	Lantana	*Lantana camara.*
Aathi	....	*Bauhinia racemosa.*
Attanari kongu	....	*Pygeum Wightianum.*
Avaram	....	*Cassia auriculata.*
Ayama	....	*Careya arborea.*
Boothali	....	*Givotia rottleriformis.*
Chatanangu	....	*Heritiera papilio.*
Chinna polavu	....	*Pterospermum rubiginosum.*
Chini	....	*Tetrameles nudiflora.*
Chinna perambu	Canes	*Calamus pseudotenuis.*
Chokala	....	*Aglaia Roxburghiana.*
Cholavenga	....	*Bischofia javanica.*
Chona athi	....	*Ficus hispida.*
Chorapanu	....	*Myristica attenuata.*
Chukannakil	....	*Cedrela Toona.*
Elalai palai	....	*Alstonia scholaris.*
Elam	Cardamom	*Elettaria cardomomum.*
Errukkali	....	*Calotropis giganta.*
Erumpakam	Iron wood	*Hopea parviflora.*
Eta	....	*Ochlandra Beddomei.*
Ethukanni	....	*Loranthus.*
Huli makay	....	*Meliosma Arnottiana.*
Ichi	....	*Ficus Tsiela.*
Ichimaram	....	*Ficus glomerata.*
Ilavu	Cotton tree	*Bombax malabaricum.*
Inji	Ginger	*Zinziber officinale.*
Irool	....	*Xylia xylocarpa.*
Irumpakam	....	*Hopea parviflora.*
Itakalli	....	*Ochlandra travancorica.*
Jathika	....	*Myristica laurifolia.*
Kadukkai	Gallnut tree	*Terminalia chebula*
Kaiva	....	*Helicteres isora.*
Kalar Athi	....	*Dolichandrone falcata*
Kal moongil	Male bamboo	*Dendrocalamus strictus.*
Kambali pision	....	*Gardenia gummifera.*
Kana kamuku	....	*Pinanga Dicksonii.*
Kapila	....	*Mallotus philippinensis.*
Karagil	....	*Amoora canarana.*
Karei (nagaram, Alangi)	....	*Elæocarpus serratus.*
Karimarudu	....	*Terminalia tomentosa.*
Kar Indu	....	*Acacia Intsia.*
Karu avarai (Kannu avarai or Pilavarai).	....	*Mundulea suberosa.*
Karukuva	....	*Elæodendron glaucum.*
Karumpalai	....	*Mimusops hexandra.*
Karupalai (irkote)	....	*Putranjiva Roxburghii.*
Karuva	Cinnamon tree	*Cinnamomum zeylanicum*
Karuvelam	....	*Acacia arabica.*
Karuveppilai	Curry leaf	*Murraya Kœnigii.*
Kassan (Kayan)	....	*Memecylon edule.*
Katampalam	....	*Spondias mangifera.*
Katelumicham	....	*Atalantia monophylla.*
Katjathika	....	*Myristica malabarica.*
Kat veppilai	....	*Clausena Willdenowii.*
Katta Karei	....	*Elæocarpus oblongus.*
Kattarasu	....	*Ficus tomentosa.*
Katt iluppa	The star apple	*Chrysophyllum Roxburghii*
Kattu cheru	....	*Holigarna Arnottiana.*
Kattu kuvai	....	*Curcuma spp.*
Kattumuringa	....	*Moringa pterygosperma.*

Tamil name.	English name.	Botanical name.
Kattumurukku	....	*Zanthoxylum Rhetsa.*
Kattu perambu	....	*Calamus Rheedii.*
Kattu poovam (Shenpuvam) ..	....	*Nephelium longana.*
Kawili (Thondi)	....	*Sterculia guttata.*
Kalakkai	....	*Carissa carandas.*
Kiluvai	....	*Protium caudatum.*
Kodukkapuli	....	*Garcinia cambogia.*
Kolakattai	....	*Premna tomentosa.*
Kolamavu	....	*Machilus macrantha.*
Kol ichi	....	*Ficus retusa.*
Koli payar	....	*Olea dioica.*
Konnai	The Indian laburnum (or Rela bark).	*Cassia Fistula.*
Korai pillu	Korai grass	*Cyperus pangarai.*
Kottai	....	*Zizyphus Xylopyrus*
Kulapanei	....	*Glycosmis pentaphylla.*
Kumil	....	*Gmelina arborea.*
Kumilamchedi	....	*Gmelina asiatica.*
Kundumani	....	*Abrus precatorius.*
Kurinji	....	*Strobilanthes barbatus.*
Madayan sampirani	....	*Hardwickia pinnata.*
Mahali	....	*Gymnema montanum.*
Maila	....	*Vitex altissima.*
Makki	....	*Gardenia morella.*
Mala konnai	....	*Acrocarpus fraxinifolius.*
Mala vembu	....	*Melia dubia*
Malukkarai	....	*Randia dumetorum*
Mamaram	Mango tree	*Mangifera indica.*
Mancharei	....	*Agrostistachys indica.*
Manjakadambai	....	*Adina cordifolia.*
Manjal	Turmeric ..	*Curcuma longa.*
Manjee	Fibre	*Cartalaria juncea.*
Man perambu	Canes	*Calamus travancoricus.*
Maravetti	....	*Hydnocarpus Wightiana.*
Mara Uri (Alli)	....	*Antiaris toxicaria.*
Mathi (Kolmarudu)	....	*Terminalia Arjuna.*
Mattipal	....	*Ailanthus malabarica.*
Mavelingam	....	*Crataeva religiosa.*
Milaku	....	*Piper nigrum.*
Minnai	....	*Premna integrifolia.*
Moongil	Bamboo ..	*Bambusa arundinacae.*
Mulkiluvai	....	*Balsamodendron Berryi.*
Mulkottai	....	*Zizyphus xylocarpa.*
Mul vengai	....	*Bridelia retusa.*
Murutthan	....	*Sterculia villosa.*
Nagaramaram	....	*Elæocarpus serratus.*
Nakuloi	....	*Polyalthia coffeoides.*
Nallakarai	....	*Canthium parviflorum.*
Nanal pillu	Grass	*Amrido dorax.*
Narivela (Naivela)	....	*Limonia acidissima.*
Narivirium	....	*Cordia fulvosa.*
Naval	....	*Eugenia spp.*
Nedunar	....	*Polyalthia cerasoides.*
Nellikkai	(Indian Gooseberry)	*Phyllanthus Emblica.*
Ningal	....	*Filicium dicipiens.*
Nirkadamba	....	*Stephegyne parvifolia.*
Noona	....	*Morinda citrifolia.*
Odai	....	*Acacia Latronum.*
Oddamaram	....	*Cleistanthus collinus.*
Pachali	....	*Dalbergia paniculata.*
Palai	....	*Wrightia tinctoria.*
Pali	....	*Dichopsis elliptica.*
Papatan	....	*Webera corymbosa.*
Parambai	....	*Acacia ferruginea.*
Parandai	....	*Vitis quadrangularis.*
Pavetta	....	*Pavetta hispidula.*
Peemaram (Periyamaram) ..	....	*Ailanthus excelsa.*
Perugilei	....	*Clerodendron infortunatum.*
Pila	Jack tree ..	*Artocarpus integrifolia.*
Pinari	....	*Sterculia fœtisa.*
Poochakottai	Soap nut	*Sapindus emarginatus.*
Poola	....	*Fluggea microcarpa.*
Poopathiri	....	*Stereospermum chelonoides.*

Tamil name.	English name.	Botanical name.
Poovam	....	*Schleichera trijuga.*
Poovarasu	Portia tree	*Thespesia populnea.*
Porasu	....	*Chloroxylon Swietenia.*
Pulivagai	....	*Albizzia stipulata.*
Puliyamaram	Tamarind tree	*Tamarindus indicus.*
Pumaruthu	....	*Lagerstrœmia Flos Reginæ.*
Punnai	....	*Dillenia pentagyna.*
Ruthracham	....	*Elæcarpus tuberculatus.*
Santhana viri	....	*Lansium anamalayanum.*
Sapathukalli	Prickly pear	*Opuntia Dillenii.*
Sarai (Morala)	....	*Buchanania latifolia.*
Seemapoola	....	*Eriodendron anfractuosum.*
Seekai	Seekai	*Acacia concinna.*
Selavagai	....	*Albizzia odoratissima.*
Semblichi	....	*Aphania bifoliolata.*
Senni	....	*Acalypha fruticosa.*
Sherankottai	....	*Semecarpus Anacardium.*
Shulundu (Kora)	....	*Ixora parviflora.*
Sigappu Indu	....	*Pterolobium indicum.*
Sirukarai	....	*Randia malabaricum.*
Soluvam	....	*Daphniphyllum glaucescens*
Sorapalai	....	*Nothopegia Colebrookiana.*
Srikonnai	Poonspar tree	*Calophyllum elatum.*
Sulunthu	....	*Canthium didymum.*
Sundakkai	Wild brinjal	*Solanum pubescens.*
Surai	....	*Zizyphus Oenoplia.*
Suruli	....	*Mesua ferrea.*
Tekku	....	*Tectona grandis.*
Thadachi	....	*Grewia tiliæfolia.*
Thali	....	*Actinodaphne Hookeri.*
Thanakku	....	*Cochlospermum gossypium.*
Thani	....	*Terminalia belerica.*
Thennamaram	Coconut tree	*Cocos.*
Therani	....	*Chomelia asiatica.*
Thattan	....	*Strychnos potatorum.*
Thirukukalli	....	*Euphorbia antiquorum.*
Thorattimul	....	*Capparis grandiflora.*
Thevarai	....	*Wendlandia notoniana.*
Udi (Uthi, Kakausil)	....	*Odina wodier.*
Unjal	....	*Albizzia amara.*
Unnu	....	*Grewia asiatica.*
Vagai	....	*Albizzia Lebbek.*
Vakkana	....	*Diospyros affinis.*
Valsura	....	*Walsura piscidia.*
Varanga	....	*Carallia lucida.*
Vatta	....	{ *Macaranga peltata.* / *Macaranga Roxburghii.*
Vazala	....	*Pœciloneuron indicum.*
Vazhai	....	*Musaparad sisera*
Vedathala	....	*Dichrostachys ciner a*
Vedipla	....	*Cullenia excelsa.*
Vekkali	....	*Anogeissus latifolia.*
Vellagil	White cedar	*Dysoxylum malabaricum.*
Vella indu	....	*Acacia pennata.*
Vellakuntrikam	....	*Vateria indica*
Vellamamdu (Pilla marudu)	....	*Termsnalia paniculata*
Vellathanuku	....	*Gyrocarpus* { *americanus.* / *Jacquini.*
Vellelembu	....	*Hemicyclia elata.*
Velvelam	....	*Acacia leucophlœa.*
Vembadam	Buckthorn climber	*Ventilago madraspatana.*
Vengai	....	*Pterocarpus marsupium.*
Vennalankodi	....	*Hiptage madablota.*
Venteak	....	*Lagerstrœmia lanceolata.*
Veppam	Morgosa	*Azadirachta indica.*
Veppula	....	*Fluggea leucopyrus.*
Vilankai	Elephant apple tree	*Ferona Elephantum.*
Virali	....	*Dodonœa viscosa.*
Virusham	....	*Cordia Myxa.*
Vittil	....	*Aporosa Lindleyana.*
Yelandai	....	*Zizyphus Jujuba.*
Yetti	....	*Strychnos Nux-vomica.*

APPENDIX V.

Form of Control Journal for the Selection Working Circle—Evergreen Forests—Punachi Range and the Plantation Working Circle, Punachi Range.

The following headings are suggested as being suitable :—

A. *Growing stock* :—

(i) Constitution of the working circle—modifications desirable.

(ii) Natural reproduction.

(iii) Seasons of leaf fall—new leaf, etc.

(iv) Seasons of flowering and ripening of the seeds of species.

(v) Rate of growth, etc.

B. *Factors influencing the crop* :—

(i) Forest offences.

(ii) Fire-protection and fires.

(iii) Climate—record of monthly and annual rainfall.

(iv) Injuries by weed—strobilanthes, weeds, creepers, etc.

(v) Other causes of injury to trees, seeds, etc.

C. *Results of work done* :—

(i) Marking for fellings, and results of operations.

(ii) Costs of extraction, markets and prices obtained.

(iii) Labour and extraction notes.

(iv) Works of improvement, roads and paths, etc.

(v) Climber cutting, or other improvement to the tree crop.

(vi) Measures of artificial regeneration—costs and results.

(vii) Financial results as compared with the forecast in the working plan.

(viii) Prescriptions of the working plan reviewed—reference Conservators' or District Forest Officer's inspection notes.

Form of Control Journal for the Fuel Working Circle.

The following headings are suggested as being suitable :—

A. *General.*—Constitution of the working circle.

B. *Forest Offences.*—Their nature and intensity.

C. *Fire protection* :—

(i) Time of the year, cost of operation and results.

(ii) Areas burnt by late fires, with their origin and cause and the damage.

D. *Grazing.*—Result of closure of coupes—condition of the growing stock from year to year after the coupes are reopened to grazing.

E. *The fellings.*—Agency and method of fellings employed, time of the year when the work was taken up and completed, etc.

F. *Regeneration* :—

(i) Natural regeneration.

(ii) Season of flowering and ripening of seed.

(iii) Rate of growth of coppice of same of the more important species.

(iv) Rab regeneration.

G. Cost of extraction, market for the produce extracted, etc.

H. Financial results as compared with those anticipated in the working plan.

I. General remarks.

Form of Control Journal for Bamboo Working Circle.

(i) *General.*—Constitution of the working circle, suitability of the felling series, facility of working of each of the felling series as regards accessibility, markets, etc.

(ii) *Agency of working.*—Brief notes on coupe sales including time of the year when the sale was held—important dealers in bamboo—their sphere of trade.

(iii) *The fellings.*—Source of labour—cost of each operation until the produce reaches the market, the quality of the work (thinnings) carried out.

(iv) *Regeneration.*—Bamboo flowering.

(v) *Yield.*—Locality where consumed, etc.

(vi) Financial results as compared with those of the working plan.

(vii) General remarks including District Forest Officer's and Conservator's inspection notes.

Form of Control Journal for Minor Forest Produce Working Circle.

(i) *General.*—Constitution of the Working Circle.

(ii) Time when each item of produce was available for extraction, its abundance, etc.

(iii) Time of the year when the right of collection was leased, the units of sale adopted and the revenue on each unit realized, as compared with the revenue realized in the previous years, with explanation for the variations, etc.

(iv) Agency employed for collection and the rate paid for the collection of each item of the produce at specified centres.

(v) Yield of each item of produce, the method employed of ensuring the accuracy of the yield figures in case the right for collection of the produce has been leased, the selling rates in the neighbouring market for each of the produce, etc.

(vi) Financial results as compared with those anticipated in the working plan.

(vii) General remarks.

Form of Control Journal for Grazing Working Circle.

(i) *General.*—Constitution of the working circle.

(ii) Rates of grazing fees in force from time to time with the average annual grazing incidence and revenue for each range.

(iii) Localities overgrazed, etc., with reasons for the same, time of the year when cattle depend entirely on forest grazing—adequacy or otherwise of fodder in localities most frequented by cattle with steps, if any, taken to ease the situation.

(iv) Localities where penning is permitted—number of cattle penned, localites to which cattle belong—rate and conditions governing penning, etc.

(v) Effect of early burning on the fodder resources of the forest during the season.

(vi) Extent to which and the localities from which, free removal of fodder and thatch grass in headloads took place each year.

(vii) Financial results as compared with those of the working plan.

(viii) General remarks.

Control Book for the Selection Working Circle.

(Punachi Range.)

Prescription of the working plan.				Operations carried out.									Remarks.
Year.	Locality to be exploited.		Yield (if prescribed).	Year	Locality exploited.		Datails of yield.						
	Coupe.	Area in in acres.			Coupe.	Area in acres.	Species.	Number of trees felled.	Yield of logs in c. ft.	Sawn or other converted produce. Kind.	Volume in c.ft.	Percentage of yield.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)

N.B.—All deviations are to be shown in red ink, as also authority for them in the remarks column.

Control Book for the Plantation Working Circle.

(Punachi Range.)

Prescriptions of the working plan.						Operations carried out.									Remarks.
Year.	Locality to be exploited.			Yield (if prescribed).	Nature of felling.	Year.	Locality exploited.			Nature of felling.	Details of yield.				
	Compartment.	Coupe.	Area in acres.				Compartment.	Coupe.	Area in acres.		Species.	Number of trees felled.	Number of logs.	Yield in cubic feet.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
					A. Clear-felling.					*A. Clear-felling.*					
					B. Selection felling.					*B. Selection felling.*					

N.B.—All deviations are to be shown in red ink, as also authority for them in the remarks column.

Control Book for the Fuel Working Circle.

Prescriptions.			Operations carried out.						Remarks (outturn per acre, etc.).
Year.	Locality to be exploited.		Year.	Locality exploited.			Details of yield.		
	Coupe.	Area in acres.		Coupe.	Surveyed area in acres.	Area actually worked in acres.	Description of outturn.	Weight or volume of the outturn.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Felling Series.				

N.B.—All deviations are to be shown in red ink, as also authority for them in the remarks column.

Control Book for the Bamboo Working Circle.

Prescriptions of the working plan.					Operations carried out.					Remarks.
Year.	Locality to be exploited.				Year.	Locality exploited.		Yield.		
	Name of range.	Name of felling series.	Coupe.	Area in acres.		Coupe.	Area in acres.	Description.	Quantity.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

N.B.—All deviations are to be shown in red ink, as also authority for them in the remarks column.

Control Book for the Minor Forest Produce Working Circle.

Year.	Range.	Particulars of lease or sale unit.	Period of lease.	Yield.		Remarks.
				Volume.	Weight.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)

N.B.—All deviations are to be shown in red ink, as also authority for them in the remarks column.

Control Book for the Grazing Working Circle.

Year.	Total area of the division in acres.	Area closed with details.	Area open.	Details of free grazing allowed.	Range in which permits were issued.	Animals admitted.			Total Number or cow units.	Names of pens allowed.	Number of cattle penned.	Remarks.
						Number of cows.	Number of buffaloes.	Number of sheep.				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

N.B.—All deviations are to be shown in red ink, as also authority for them in the remarks column.

Record of works.

(Note.—A common form, but to be maintained separately for each of the following working circles and for miscellaneous items.)

1. The selection working circle.
2. The plantation working circle.
3. The fuel working circle.
4. The bamboo working circle.
5. The protection working circle.

Prescriptions of the working plan.			Operations carried out.					Remarks.
Year.	Nature of work.	Brief details of work.	Year.	Nature of work.	Brief details of work.	Cost of each item.	Total cost of each work.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				Works prescribed.				
				Works suggested.				
				Works neither prescribed nor suggested.				

N.B.—All deviations are to be shown in red ink, as also authority for them in the remarks column.

Sandal Propagation Centres' Journal.

(Udamalpet Range.)

Year.	Name of beat.	Locality.	Propagation centres.			Origin of sandal seed.	Name of host species used.	Date of sowing.		Date of first germination of sandal.	Date of completion of germination of sandal excluding abnormal delayed germination.	Replacement of casualties.		Survivals at the beginning of the second growing season.		Survivals at the beginning of the third growing season.		Remarks.
			Serial number.	Size.	How formed.			Sandal.	Host.			Date.	Number of seedlings.	Date of enumeration.	Number of seedlings.	Date of enumeration.	Number of seedlings.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)

Ledger for Gap Regeneration.

Year of regeneration :
Number of gaps regenerated :
Average number of patches per gap :
Species introduced :
Distribution of species in gaps :

Number of coupe regenerated. Area. Acres.

Subordinate staff in special charge :
Wages of coolies :
Average stocking of gaps at beginning of second growing season :
Average stocking of gaps at beginning of third growing season :

Month and year.	Clearing the ground.	Staking and preparation of the ground.	Cost of seed.	Sowing at stake.	Cost of stumps.	Stump planting.	Replacement of casualties.	Freeing, weeding and soil working.	Other expenditure [specify details in column (11).]	Details of other expenditure.	Total cost at end of each year.	Total cost per acre at end of each year.	Average cost per gap at end of each year.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)

NOTE.—The ledger will be maintained monthly by the Range Officer, and annually in the District Forest Office, as described for the Plantation Working Circle.

Regeneration Ledger for the Plantation Working Circle.

(Punachi Range.)

Year of plantation :
Date of timber felling from to
Date of clear-felling from to
Date of burning:
Date of piling and reburning from to
Date when the cultivators left the coupe :
Subordinate establishment in special charge :
Rate of daily wages of coolies :

Compartment number.	Section or sub-compartment.	Area in acres.	Species. introduced.	Area of each species introduced.	Espacement.	Method of regeneration.	Date of sowing or planting each species.	Remarks.

Percentage of stocking at beginning of second growing season for each species separately :—
Teak........per cent. *Dalbergia latifolia*......per cent. *Pterocarpus mrsupium*......per cent.
Percentage of stocking at beginning of third growing season.

Month and year.	Clear-felling.	First burn.	Piling and reburning.	Cost of seed.	Proportion of nursery costs.	Aligning and staking.	Making inspection paths.	Dibbling seed at stake (original).	Stump-planting (original).	Replacing casualties.	Freeing, weeding and soil working.	Fire-protection (proportion by area).	Other expenditure [specify details in column (15)].	Details of other expenditure.	Monthly rainfall in inches.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)

NOTE.—This record will be maintained in the above form by the Range Officer, who will enter all expenditure monthly. The total of each column will be struck annually on 31st March previous annual total being included so as to give the total cost from the commencement of the plantation. An abstract in the same form will be kept in the District Forest Office in which yearly totals only are recorded. The record will only be maintained until the plantation is established, which will normally be at the end of three years.

Regeneration Ledger for the Fuel Working Circle.

Rab-Regeneration.

(.................Range.)

Fuel felling series :
Year of regeneration:

Number of coupe regenerated :
Area of coupe :
Number of rab-lines :
Average number of seed patches per year.

Nature of operations.	Date of operation.	Total cost.	Rate of coolie wages.	Species sown with proportions of total quantity sown.	At beginning of second growing season.		At beginning of third growing season.		Remarks.
					Number of successfull patches.	Average number of seedlings per patch.	Number of successful patches.	Average number of seedlings per patch.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Proceedings of the Chief Conservator of Forests

Proceedings No. 74, Press, 12th February 1935

Working Plan—Coimbatore South Division—Sanctioned.

A. WIMBUSH, Esq., I.F.S.,
Chief Conservator of Forests.

READ—the following paper :—

Letter from the Conservator, Working Plans Circle, dated 6th January 1935, No. 1178/31-A.

Proceedings—No. 74, Press, dated 12th February 1935.

The working plan is sanctioned.

A. WIMBUSH,
Chief Conservator of Forests.

(True copy)

C. SHELSWEL,
Personal Assistant.

To the Conservator of Forests, Working Plans Circle.
,, Conservator of Forests, Coimbatore Circle.

Copy to the District Forest Officer, South Coimbatore.
,, other Conservators and District Forest Officers.
,, the Principal, Madras Forest College.
,, the Working Plans Officers.
,, the Provincial Sylviculturist.
,, the President, Forest Research Institute, Dehra Dun.

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